C21.5 : 950/1

Vol. 950 Number 1

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of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

September 7, 1976

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DEPARTMENT
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Patent
and
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Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

September 7, 1976 Volume 950 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Registration to Practice

The following are names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before September 30, 1976.

Anderson, J. Wayne, 830 Colson Ave., Ottawa, Ontario, Canada
Husack, Ralph, 14201 Chelmsford Rd., Rockville, Md.: 20853
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Stolwein, Walter, 5211 Roosevelt St., Bethesda, Md. 20014

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,544,246, G. H. Butterfield, CORNEAL CONTACT LENS, **filed** Oct. 10, 1969, D.C., S.D.N.Y., Doc. 69–4471, *George H. Butterfield, Sr.* v. *Vent Air Contact Lens Laboratories.* Case transferred to the Northern District of Illinois, Feb. 9, 1970. **Same, filed** Oct. 10, 1969, D.C., S.D.N.Y., Doc. 69–4472, *George H. Buptterfield, Sr.* v. *United Contact Corp.* Case transferred to the Northern District of Illinois, Feb. 9, 1970. **Same, filed** Oct. 10, 1969, D.C., S.D.N.Y., Doc. 69–4473, *George H. Butterfield, Sr.* v. *Full Sight Contact Lens Corp.* Case transferred to the Northern District of Illinois (Chicago), Feb. 9, 1970. **Same, filed** Oct. 10, 1969, D.C., S.D.N.Y., Doc. 69–4474 *George H. Butterfield, Sr.* v. *5 Continents Contact Lens, Inc.* Case transferred to the Northern District of Illinois (Chicago), Feb. 9, 1970. **Same, filed** Feb. 16, 1970, D.C., S.D.N.Y., Doc. 70C641, *George H. Butterfield, Sr.* v. *Prestige Contact Lens Inc.* Action transferred to the U.S.D.C. Northern District of Illinois (Chicago), Apr. 10, 1970.

2,976,257, Dawe and Youse, RE-DISPERSIBLE DISPERSION OF POLYTETRAFLUOROETHYLENE, **filed** June 28, 1974, D.C., S.D.N.Y., Doc. 74–2812, *Wallace Clark & Co., Inc.* v. *Acheson Industries, Inc.*

2,980,982, Costa, LeBoeuf, and Lefevre, FIBROUS ARTICLE; **3,214,899,** Wininger, Jr. and Dyer, CORDAGE PRODUCT, **filed** Aug. 14, 1975, D.C., N.D. Ala. (Birmingham) Doc. CA–75–G–1445–E, *Eastman Kodak Company* v. *Wellington Fibres, Incorporated.* Consent judgment, patents are valid and belong to plaintiff. Defendant is permanently enjoined against infringing any claim of said patents, Apr. 14, 1976.

3,000,380, G. O. Doherty, MEANS AND METHODS OF INJECTING OR INFUSING FLUIDS INTO PATIENTS; **3,010,453,** same, APPARATUS FOR INTRAVENOUSLY ADMINISTERING FLUID; **3,047,884,** Doherty and Ballard APPARATUS FOR INJECTING OR INFUSING FLUIDS INTO PATIENTS AND METHOD OF MAKING SAME, **filed** June 21, 1972, D.C. Mont. (Butte) Doc. 2173, *George O. Doherty* v. *Deseret Pharmaceutical Company, Inc.* Pursuant to stipulation of parties an order was filed dismissing action with prejudice, Apr. 16, 1976.

3,010,453. (See 3,000,380.)

3,017,884. (See 3,000,380.)

3,029,650, J. P. Byrd, PUMPING DEVICE, **filed** Mar. 17, 1976, D.C. Colo. (Denver) Doc. 76–W–297, *Kimbark Company* v. *Am-Sac, Inc.* Consent judgment, defendant restrained from further infringement on patent, Apr. 14, 1976.

3,032,345, J. H. Lemelson, TARGET GAME, **filed** Dec. 17, 1975, D.C.N.J. (Trenton) Doc. 75–2168, *Gammon, Inc., doing business as Gammon Games* v. *Jerome H. Lemelson and Synergistics Research Corporation.*

3,056,836, H. D. Moed, ARALKYLAMINES AND METHODS OF PREPARATION THEREOF, **filed** June 6, 1975, D.C., N.D. Ill. (Chicago) Doc. 75c1846, *Mead Johnson & Company and U.S. Philips Corporation* v. *Generic Pharmacal, doing business as Ample Pharmacal Co. and Danbury Pharmacal, Inc.* Cause dismissed, Feb. 23, 1976.

3,081,392, E. L. Warner, HIGH-FREQUENCY OVEN, **filed** Apr. 13, 1976, D.C., N.D. Ohio (Cleveland) Doc. C76–377, *The Tappan Company* v. *Litton Industries, Inc., Litton Systems, Inc. and Schwede Appliance Village.*

3,180,378, R. R. Carlton, BRUSH CUTTING CHAIN, **filed** Dec. 17, 1975, D.C. Oreg. (Portland) Doc. 75–1157, *Omark Industries, Inc.* v. *Carlton Company and Raymond R. Carlton.*

3,180,557, S. G. Thulin, BAG WITH HANDLE OF WELDABLE PLASTIC MATERIAL, **filed** Apr. 8, 1976, D.C.N.J. (Newark) Doc. 76–648, *Mobil Oil Corporation* v. *Aktiebolaget Celloplast and Celloplast U.S.A., Inc.*

3,200,140, Blackwood, Rennhard, Beereboom and Stephens, Jr., α-6-DEOXYTETRACYCLINE DERIVATIVES AND PROCESS, **filed** Jan. 10, 1973, D.C., C.D. Calif. (Los Angeles) Doc. 73–58–R, *Pfizer Inc.* v. *International Rectifier Corporation et al.* Judgment, defendants' motion for partial summary judgment is granted. Said patent is invalid and unenforceable, July 16, 1975. **Same, filed** July 9, 1974, D.C., C.D. Calif. (Los Angeles) Doc. 74–1927–LTL, *Pfizer, Inc.* v. *Revlon, Inc.* Filed conditional transfer order before the Judicial Panel on Multidistrict Litigation, to the USDC for the District of Minnesota, entered Oct. 31, 1974.

3,214,899. (See 2,980,982.)

3,249,352, L. V. Wise, COLLATING MACHINE FOR PRODUCING TAB CARD SETS, **filed** Nov. 25, 1974, D.C.N.J. (Newark) Doc. 74–1839, *Federal Business Products, Inc.* v. *Format Printing Co. Inc.*

3,264,383, Niessner, Sonnleiner, Wolf and Gutlbuber, EXTRUSION METHODS, **filed** May 8, 1975, D.C., N.D.N.Y. (Utica) Doc. 75–CV–222, *Kunststoffwerk Gebruder Anger GmbH & Co. Munchen* v. *Robintech, Inc.*

PATENT NOTICES

Certificates of Correction for the Week of Sept. 7, 1976

Re. 28,827	3,938,017	3,955,658	3,962,267
D. 239,839	3,938,102	3,955,728	3,962,354
3,673,209	3,939,084	3,956,241	3,962,438
3,706,422	3,939,559	3,956,325	3,962,563
3,743,793	3,940,207	3,956,332	3,962,573
3,790,730	3,940,254	3,956,341	3,962,626
3,794,504	3,940,266	3,956,467	3,962,658
3,822,420	3,941,698	3,956,619	3,962,764
3,828,035	3,942,017	3,956,906	3,962,840
3,829,935	3,942,123	3,956,931	3,962,883
3,847,682	3,942,178	3,957,180	3,962,939
3,850,942	3,943,285	3,957,200	3,963,306
3,856,756	3,943,686	3,957,237	3,963,455
3,867,200	3,944,400	3,957,516	3,963,672
3,870,740	3,944,708	3,957,603	3,963,673
3,872,059	3,945,575	3,957,623	3,963,680
3,873,249	3,945,776	3,957,632	3,963,724
3,873,452	3,945,995	3,957,760	3,963,778
3,873,796	3,946,005	3,957,799	3,963,787
3,878,863	3,946,050	3,957,825	3,963,837
3,881,551	3,946,080	3,957,828	3,963,840
3,883,848	3,946,712	3,957,831	3,963,842
3,887,820	3,946,954	3,957,834	3,963,900
3,888,293	3,947,430	3,957,917	3,964,025
3,888,350	3,948,689	3,957,954	3,964,142
3,896,458	3,948,763	3,957,960	3,964,207
3,901,942	3,950,426	3,958,459	3,964,419
3,904,642	3,950,509	3,958,572	3,964,583
3,904,735	3,951,021	3,958,713	3,964,587
3,906,625	3,951,782	3,959,125	3,964,611
3,907,715	3,951,891	3,959,259	3,964,795
3,914,774	3,951,977	3,959,475	3,964,811
3,915,274	3,952,023	3,959,819	3,964,878
3,916,924	3,952,538	3,959,820	3,965,018
3,917,404	3,952,610	3,959,827	3,965,057
3,917,648	3,952,899	3,959,953	3,965,083
3,918,338	3,952,927	3,960,106	3,965,090
3,919,237	3,952,949	3,960,119	3,965,093
3,920,612	3,953,335	3,960,351	3,965,264
3,920,721	3,953,336	3,960,510	3,965,282
3,923,148	3,953,364	3,960,849	3,965,290
3,923,288	3,953,712	3,960,865	3,965,382
3,923,738	3,954,159	3,961,000	3,965,397
3,923,790	3,954,190	3,961,081	3,965,629
3,923,977	3,954,445	3,961,111	3,965,660
3,924,018	3,954,446	3,961,151	3,965,835
3,926,524	3,954,733	3,961,165	3,965,884
3,926,854	3,954,812	3,961,463	3,966,274
3,927,646	3,954,889	3,961,471	3,966,666
3,928,438	3,955,050	3,961,606	3,966,770
3,928,592	3,955,084	3,961,669	3,966,811
3,931,878	3,955,091	3,961,747	3,966,897
3,933,308	3,955,243	3,961,953	3,966,925
3,933,476	3,955,281	3,961,973	3,967,380
3,933,879	3,955,292	3,962,026	3,967,553
3,935,333	3,955,309	3,962,089	3,967,645
3,935,571	3,955,374	3,962,180	3,967,649
3,935,679	3,955,486	3,962,205	3,967,915
3,937,922	3,955,561	3,962,231	3,969,459

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF AUGUST 14, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds: Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry: Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-2-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur: Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-2-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	10-1-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products: Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions: Bleaching; Dyeing and Photography.	9-17-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods: Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-2-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization: General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures: Illumination: Horology; Acoustics; Recorders; Weighing Scales.	5-21-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	11-6-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	11-3-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	2-13-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-3-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	4-30-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists: Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	11-10-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	2-18-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-22-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	8-7-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	2-2-76

Expiration of patents: The patents within the range of numbers indicated below expire during August 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,897,500 to 2,901,748 inclusive
Plant Patents..... Numbers 1,856 to 1,860 inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED SEPTEMBER 7, 1976

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T950,001

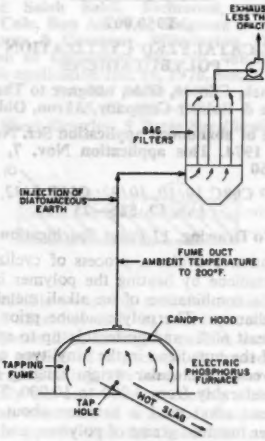
BAG FILTERING METHOD FOR HYGROSCOPIC PARTICULATES

Edwin D. Myers, Sheffield, Ala., assignor to Tennessee Valley Authority

Filed Dec. 19, 1974, Ser. No. 534,193

Int. Cl.² B01D *46/04*
U.S. Cl. 55—96

1 Sheet Drawing. 10 Pages Specification



BAG FILTER FLOW DIAGRAM FOR REMOVING HYGROSCOPIC SUBMICRON FUME

A process for the recovery of hygroscopic submicron particulates from high opacity stack gas using bag filters precoated with diatomaceous earth to absorb the hygroscopic particulates. Hygroscopic fume such as P_2O_5 laden fume resulting from the slag tapping operation of electric phosphorus furnaces is collected in a hood and piped to a bag filter house. The precoat is applied by continuous or intermittent injection of relatively small amounts of the diatomaceous earth into the airstream prior to its entry into the bag filters. When the pressure drop across the filters has increased to a predetermined amount, the filter cake is removed dry from the surface of the bags by shaking or by a reverse jet of air. The precoating of the filter bags with diatomaceous earth substantially eliminates the problem of blinding and increases collection efficiency.

T950,002

COMPOSITIONS FOR THE STABILIZATION OF FLAME RETARDANT STYRENIC POLYMERS

Richard Bradley, 303 Broadway, Dobbs Ferry, N.Y. 10522; Joseph Martin Farber, 28 Braddock Court, Yorktown Heights, N.Y. 10598; and Lawrence A. Testa, Candlewood Isle, Box 128, New Fairfield, Conn. 06810

Filed Oct. 28, 1975, Ser. No. 626,388

Int. Cl.² C08K *5/53*
U.S. Cl. 260—45.75 N

No Drawing. 39 Pages Specification

Flame retardant styrenic polymers which are normally subject to ultraviolet light and oxidative deterioration are stabilized against said deterioration by incorporating therein, light stabilizers such as substituted benzotriazoles, hindered amines, or hindered phenol metal phosphonates, or a mixture thereof, and combinations of these light stabilizers with a hindered phenol antioxidant, an acid acceptor such as a metal organic salt, such as zinc stearate and tin maleate, or an oxirane compound, and also optionally a thioester, an organic phosphite, such as distearyl pentaerythritol dephosphite.

T950,003

PROCESS FOR PREPARING PROTECTIVE FIBROUS PACKAGING FORMS

Cephas H. Sloan, Rte. 3, Lakeshore Drive, Kingsport, Tenn. 37663

Filed Apr. 3, 1975, Ser. No. 564,939

Int. Cl.² B29C *27/22*
U.S. Cl. 264—271

No Drawing. 3 Pages Specification

Process for forming cellulose acetate staple fiber or continuous filament fiber into a protective package for articles. The cellulose acetate fiber is sprayed with a nontacky bonding plasticizer in the amount of 3–20% by weight and then packed around the article to be protected. The fiber bonds without heat to form a firm protective covering for the article. The preferred bonding plasticizers are prepared from low molecular weight acid esters of glycerol or triethylene glycol.

T950,004

COLLECTOR CLAMP CIRCUIT

Robert Albert Tuttle, Huntsville, Ala., assignor to International Business Machines Corporation, Armonk, N.Y

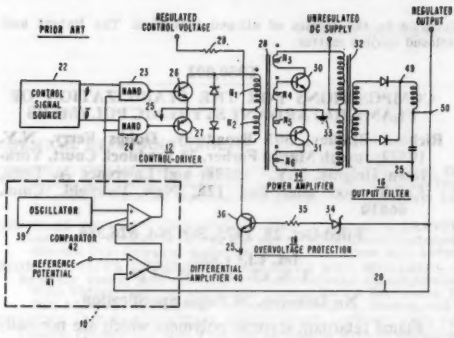
Continuation of abandoned application Ser. No. 537,813, Dec. 31, 1974. This application May 30, 1975, Ser. No. 582,537

Int. Cl.² H02M *7/00*
U.S. Cl. 321—26

2 Sheets Drawing. 9 Pages Specification

A collector clamp circuit is disclosed for establishing a fixed current gain for the power transistor in a switch-

ing regulator and preventing the power transistor from saturating during conduction while increasing the switching efficiency of the regulator by eliminating losses due to the storage time of the power transistor. The emitter of the power transistor is connected to ground through a first secondary winding of an interstage current transformer. The power transistor is driven by a second secondary winding of the interstage current transformer



connected across its base-emitter junction. The collector clamp comprises a third secondary winding of the current transformer connected in series with a diode across the base-collector junction of the power transistor. The turns ratio of the second and third transformer windings can be arbitrarily set to hold the collector to emitter voltage of the power transistor at a predetermined level during its conduction period.

T950,005

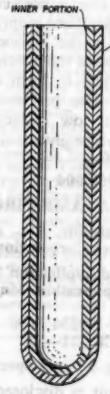
PARISON COMPRISED OF MATING PORTIONS

Edward R. Hollander, Jr., 213 Montezuma St., Kingsport, Tenn. 37664

Filed Aug. 7, 1975, Ser. No. 602,715

Int. Cl.² B32B *9/04*
U.S. Cl. 428—35

1 Sheet Drawing. 3 Pages Specification



Disclosed is a parison comprised of a plurality of mating portions, at least one of the mating portions being comprised of poly(ethylene terephthalate).

T950,006

METHOD FOR REDUCING NOXIOUS GAS CONTENT OF AUTOMOBILE EXHAUST

Leonard Leibowitz, Chicago, and Martin G. Chasanov, Homewood, Ill., assignors to the United States of America as represented by the United States Energy Research and Development Administration

Filed Nov. 6, 1975, Ser. No. 629,261

Int. Cl.² B01D *53/00;* B01K *1/00*
U.S. Cl. 204—177

No Drawing. 13 Pages Specification

The concentration of noxious gases—including NO_x—in automobile exhaust is substantially reduced by drying the exhaust and subjecting the exhaust for at least 15 seconds to a low-intensity electric arc. A Telsa coil producing high-voltage, high-frequency damped pulse with the pulses repeating every $\frac{1}{120}$ second is useful for producing this arc. Exposure of the exhaust to a low-intensity, 13 mm. arc for 15 seconds to 2 minutes reduces the concentration of NO_x and other noxious gases whereas exposure to a high-intensity arc increases the concentration of NO_x.

T950,007

BASE-CATALYZED CYCLIZATION OF POLYBUTADIENE

James Oziomek, Clinton, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of abandoned application Ser. No. 452,774, Mar. 20, 1974. This application Nov. 7, 1975, Ser. No. 629,960

Int. Cl.² C08C *19/10, 19/22;* C08F *8/32, 8/48*
U.S. Cl. 526—21

No Drawing. 17 Pages Specification

This invention provides a process of cyclizing a high vinyl polybutadiene by heating the polymer in a hydrocarbon with a combination of an alkali metal alkyl and a chelating diamine. The polybutadiene prior to cyclization has at least 60%, and preferably up to at least 95% by weight of the butadiene in the vinyl-type of repeating units, the average molecular weight ranging from 1,000 to 10,000, preferably from 3,000 to 10,000. The amount of alkali metal alkyl used is between about 1 and 100 millimoles per hundred grams of polymer, and the chelating diamine is provided in a molar ratio to the alkali metal alkyl, of about 0.1 to 10.0. The cyclizing temperature ranges from about −10° to 100° C., preferably between 30° and 80° C.

T950,008

MODIFYING ARAMIDS

Winfred E. Weldy, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

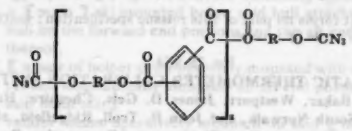
Continuation of abandoned application Ser. No. 550,410, Feb. 18, 1975. This application Dec. 19, 1975, Ser. No. 642,223

Int. Cl.² B32B, *5/28;* D06M *13/38*
U.S. Cl. 428—395

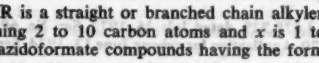
No Drawing. 21 Pages Specification

It has been found that the adhesion of aramid polymers (such as described in U.S. Pats. Nos. 3,652,510; 3,699,085; 3,673,143; etc.) can be greatly improved by modifying their surface with certain azidoformate compounds. The modification reaction can be initiated either thermally or by irradiation. The azidoformate compounds

which can be so used are the hydroxyalkylphthalate azidoformates having the formula



where R is a straight or branched chain alkylene radical containing 2 to 10 carbon atoms and x is 1 to 10, and epoxy-azidoformate compounds having the formula



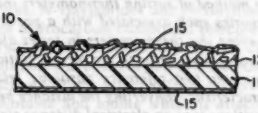
where R′ is a polyvalent organic radical, R″ is a hydrogen, alkyl, cycloalkyl, aryl, or aralkyl radical, and n and m are integers from 1 to 10. Typical uses of the modified aramid polymers are in reinforcing rubber tires, rubber belting and rubber hose with modified fibrous aramid material.

T950,009

CHEESE WRAPPING MATERIAL AND METHOD

Muhammad Saleh Sahli, Richmond, and Raymond Thomas Cole, Bon Air, Va., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Continuation of application Ser. No. 488,966, July 16, 1974. This application Jan. 16, 1976, Ser. No. 650,092
Int. Cl.² B65D *85/00*
U.S. Cl. 428—341
1 Sheet Drawing. 9 Pages Specification



A heat-sealable wrapping material suitable for packaging single slice hot melt extruded process cheese in which a polyester film, having the surface thereof adapted to form the outside of a package, is coated with a copolymer barrier coating. The inner surface of the package and optionally the outer barrier coating surface is aftersized with an ester wax or a hydrocarbon wax having a melting point greater than the cheese extrusion temperature to improve not only cheese/film releasability in both the warm and cool state, but also surface slip properties essential to handling and manipulating the film and package in automatic packaging machines whereby smooth, uninterrupted operation against wet and dry surfaces at different temperatures is insured.

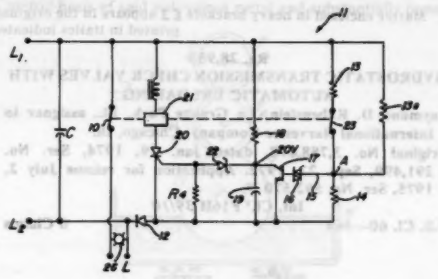
T950,010

LOW VOLTAGE PROTECTOR

Stephen J. Hogan, Coloma, and Donald R. Vander Molen, Stevensville, Mich., assignors to Whirlpool Corporation

Filed Sept. 8, 1975, Ser. No. 611,509
Int. Cl.³ H02H *3/24*
U.S. Cl. 317—31
1 Sheet Drawing. 9 Pages Specification

Electrical apparatus for preventing damage to electrical equipment as a result of a low voltage condition. The apparatus includes circuitry requiring that the voltage rise to above the dropout voltage before re-energizing the electrical equipment. The control apparatus may be provided as an integral part of the electrical equipment or may be provided as a separate device as desired. An indicator may be associated with the apparatus to indicate disconnection of the equipment because of the low voltage



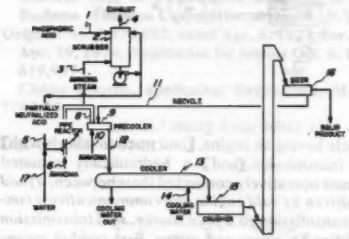
condition. The apparatus may further be arranged to provide a time delay in reconnection of the equipment.

T950,011

PRODUCTION OF SOLID AMMONIUM POLYPHOSPHATE BY CONTROLLED COOLING

Gordon C. Hicks, Sheffield, and George H. Megar, Florence, Ala., assignors to Tennessee Valley Authority

Filed Nov. 6, 1975, Ser. No. 629,281
Int. Cl.² C05B *7/00*
U.S. Cl. 71—34
1 Sheet Drawing. 9 Pages Specification



FLOWSHEET OF SOLIDIFICATION PROCESS FOR AMMONIUM POLYPHOSPHATE

Process for the production of solid ammonium polyphosphate in which ammonium phosphate melt is prepared in a pipe reactor and is solidified by controlled cooling to form crystals of a size and in quantity suitable to yield a hard, nontacky, and friable solid. Wet-process phosphoric acid is ammoniated in a pipe reactor to an NH_3:H_3PO_4 mole ratio of about 1.0, and the resulting melt is agitated and simultaneously partially cooled by introduction of cool recycled pulverized product into the melt, by blowing air through the melt, or by passing the melt through a water-jacketed trough. The partially cooled melt is then solidified continuously into nontacky sheets on a water-cooled metal surface using water or steam to slowly remove sensible heat and heat of crystallization. Up to about 55 percent or higher of the P_2O_5 in the product may be polyphosphate, the concentration of which is varied by controlling the reaction temperature with change in water input to the pipe reactor. With controlled cooling, the product is a hard, friable solid, whereas without controlled cooling, as in conventional granulation processes in which melt is added to cooled recycled fines in a drum or pugmill granulator, the product is a supersaturated solution with microcrystalline texture and is too soft and sticky to be handled.

REISSUES

SEPTEMBER 7, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 28,953

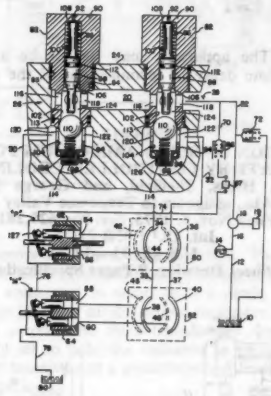
HYDROSTATIC TRANSMISSION CHECK VALVES WITH AUTOMATIC UNLOADING

Raymond D. Rubenstein, La Grange Park, Ill., assignor to International Harvester Company, Chicago, Ill.

Original No. 3,788,078, dated Jan. 29, 1974, Ser. No. 291,499, Sept. 22, 1972. Application for reissue July 2, 1975, Ser. No. 592,570

Int. Cl.[2] F16H *39/10*

U.S. Cl. 60—464 **6 Claims**



1. In a vehicle having an engine, [and traction wheels with] a hydraulic transmission, [and] a hydraulically actuated implement means operatively connected therebetween, *a fluid charge pump driven by said engine and communicatively connecting said transmission to a fluid source, said transmission having* [including] a pump and motor, first conduit means connecting the pump outlet with the motor inlet and second conduit means connecting the motor outlet with the pump inlet so that the pump supplies fluid under pressure to drive the motor, and a variable angle swash plate mechanism in the pump operable for varying the transmission ratio of the transmission and for controlling direction of fluid flow between pump and motor according to desired vehicle movement [and a fluid charge pump driven by the engine and communicatively connected to a fluid source,] the combination therewith of automatic [,] valving means communicatively interconnectable between said charge pump and the first and second conduit means [interconnecting said pump and motor] and operable in one position for porting fluid flow from said charge pump selectively to the first and second of said conduit means, and in another position for by-passing fluid between the said first and second conduit means, said automatic valve means including housing means having first and second power chamber means [, said first power chamber being controlled by pressurized fluid from] *selectively fluidly communicative with* said charge pump means [, said second power chamber being controlled by] *and* said pump and motor means, [whereby] *and spool means responsive to* pressure changes in said power chamber means [cause movement of said valve device means resulting in communicatively] *for selectively* connecting [or disconnecting] said charge pump means *and said transmission*, and said pump and motor means.

Re. 28,954

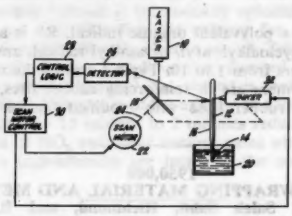
AUTOMATIC THERMOMETER CALIBRATION SYSTEM

Cole H. Baker, Westport; James D. Geis, Cheshire; Harry Gluz, South Norwalk, and John H. Troll, Ridgefield, all of Conn., assignors to Kaye Thermometer Corporation, Brooklyn, N.Y.

Original No. 3,678,729, dated July 25, 1972, Ser. No. 60,596, Aug. 3, 1970. Application for reissue June 13, 1974, Ser. No. 479,172

Int. Cl.[2] G01K *19/00*

U.S. Cl. 73—1 F **21 Claims**



17. In a thermometer calibration process wherein a selected one of a plurality of scales are affixed to a thermometer to match its temperature characteristic, said thermometer having a temperature responsive medium the position of whose end indicates temperature, the method of sorting thermometers into one of a plurality of categories each associated with a particular scale, comprising conveying the thermometers in series along a path leading to a sorting station, prior to the sorting station locating for each thermometer two reference positions related to its temperature characteristic, converting the distance between said two reference positions into an electrical distance signal having a characteristic value dependent on said distance, generating an electrical indexing signal representing the indexed position of the thermometer, and processing the distance signal and indexing signal to cause at the sorting station the automatic classification of each thermometer into its proper category.

Re. 28,955

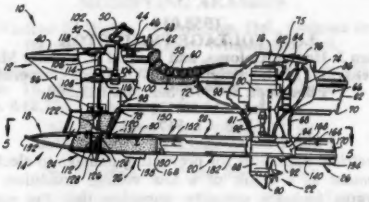
HYDROFOIL VEHICLE

William R. Stanberry, Sr., and William R. Stanberry, Jr., both of 1034 N. Kokomo, Derby, Kans. 67037

Original No. 3,827,391, dated Aug. 6, 1974, Ser. No. 353,903, Apr. 23, 1973. Application for reissue July 7, 1975, Ser. No. 593,363

Int. Cl.[2] B63H *5/06*

U.S. Cl. 115—70 **4 Claims**



1. A hydrofoil vehicle, comprising:

a. a bouyant hull having means to support a rider thereon,

b. a powering means mounted within said hull having a [propeller] *propulsion* means extending therefrom,
c. a [main] ski mounted below said hull attached to said hull on the forward end portions and the aft end portions thereof,
d. [a pair of helper skis oppositely mounted with said main ski and longitudinally alongside an aft end portion of said said main ski,]
e. rudder means operatively mounted on said [main] ski to steer the same, said rudder means comprises a *first* rudder pivotally mounted above said [main] ski *and relative thereto* and a second *smaller* rudder pivotally mounted below said [main] ski *and relative thereto*, said rudders mounted on said forward end portion of said [main] ski and essentially pivot in unison around [the same] *their respective* vertical axis, and
f. stabilizing fin means mounted on said [main] ski and extending [there below,] *therebelow*. [said stabilizing fin means includes a foward fin situated behind and adjacent to said second rudder.]

Re. 28,956

LATENT IMAGE PHOTOGRAPHIC SYSTEM

Eugene Wainer, Shaker Heights, Ohio, assignor to Horizons Research Incorporated, Cleveland, Ohio

Original No. 3,042,517, dated July 3, 1962, Ser. No. 842,569, Sept. 28, 1959. Application for reissue Feb. 1, 1971, Ser. No. 111,773

Int. Cl.[2] G03C *1/52, 5/24*

U.S. Cl. 96—48 HD **21 Claims**

1. A dry photographic film suitable for the production of visible images by exposure to a combination of light and heat, comprising (I) a film-forming plastic selected from the group consisting of cellulose derivatives and addition polymers; (II) an N-vinyl compound selected from the group consisting of N-vinylamines, N-vinylamides and N-vinylimides; and (III) a halogenated hydrocarbon compound selected from the group of compounds which produces free radicals upon exposure to light of a suitable wave length and in which there is present at least one active halogen selected from the group consisting of chlorine, bromine and iodine which is attached to a carbon atom having not more than one hydrogen atom attached thereto; there being between 0.1 and 2 parts by weight of N-vinyl compound and between 0.1 and 2 parts by weight of halogenated hydrocarbon per part of film-forming plastic, by weight.

Re. 28,957

SYNTHETIC RESIN COMPOSITIONS AND METHODS OF UTILIZING THE SAME

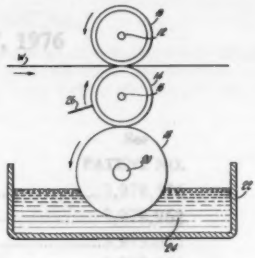
Arthur H. Drelich, Plainfield, and George J. Lukacs, Perth Amboy, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Original No. 3,849,173, dated Nov. 19, 1974, Ser. No. 260,613, June 7, 1972. Application for reissue May 8, 1975, Ser. No. 575,560

Int. Cl.[2] B05D *3/10;* **B32B** *23/02, 27/02*

U.S. Cl. 427—331 **16 Claims**

1. A method of applying a stable synthetic resin composition having an alkaline pH to porous materials and controlling the migration thereon which comprises: applying to porous materials a stable synthetic resin composition having an alkaline pH and comprising: (1) from about 0.1 percent to 60 percent by weight on a solids basis of a *carboxylated* synthetic resin; (2) from about 0.01 percent to about 5 percent by weight, based on the weight of said synthetic resin of a polyvalent metal complex coordination compound; and (3) a water-soluble, ionically-active ammonium or alkali metal salt of an acid capable of being chemically converted into an ionically-inactive polyvalent metal salt of said acid by chemical reaction and precipitation or sequestration of said polyvalent metal salt, said salt being capable of sequestering or precipitating the metal in said polyvalent metal complex coordination compound and being present in an amount of from about 5 percent to about 90 percent molecular equivalent on a stoichiometric basis of said polyvalent metal and substantially immediately destroying the stability of said synthetic resin composition to coagulate and precipitate the resin on said porous materials under controlled migration conditions.



Re. 28,958

SYNCHRONOUS DISCONNECTION AND REARRANGEMENT

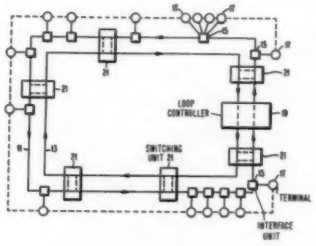
Pietro Alois Zafiropulo, Horgen, and Franz Xaver Zihlmann, Thalwill both of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Original No. 3,876,983, dated Apr. 8, 1975, Ser. No. 464,890, Apr. 29, 1974. Application for reissue Oct. 6, 1975, Ser. No. 619,997

Claims priority, application Switzerland, May 30, 1973, 7783/73

Int. Cl.[2] H04Q *9/00;* **H04J** *3/14*

U.S. Cl. 340—147 SC **5 Claims**



1. A loop-structured communication system comprising:
a main loop and an auxiliary loop parallel to each other each capable of circulating data signals in one of two possible directions opposite to each other;
a plurality of switchover units each connected at various positions in said loops for subdividing said loops into a plurality of loop sections;
a loop controller connected to said loops for controlling the data flow circulating in said loops;
delay means present in each of said switchover units for synchronizing the data flow between said main loop and said auxiliary loop when one or more of said loop sections is disconnected from the remainder of said loops.

PATENTS

GRANTED SEPTEMBER 7, 1976

ERRATA

For CLASS	See PATENT NO.
068–062	3,978,556
194–097 A	3,978,962
235–092 WT	3,979,055
235–092 MT	3,979,056
235–156	3,979,057
235–156	3,979,058
181–120	3,979,140
260–023 H	3,979,180
134–099	3,979,221
429–081	3,979,222
204–024	3,979,223
429–018	3,979,224
429–017	3,979,225
427–115	3,979,227
429–099	3,979,228
526–345	3,979,366
526–011.2	3,979,368
526–348	3,979,370
526–273	3,979,371
526–351	3,979,372
526–012	3,979,373
526–012	3,979,374
335–016	3,979,675

PATENTS

GRANTED SEPTEMBER 7, 1976

GENERAL AND MECHANICAL

3,978,525

HEAD AND CHEST PROTECTORS FOR EXAMPLE FOR MOTOR CYCLISTS

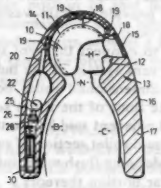
Peter William Bothwell, 114 Shipston Road, Stratford-upon-Avon, England

Filed Jan. 6, 1975, Ser. No. 538,833

Claims priority, application United Kingdom, Jan. 5, 1974, 563/74

Int. Cl.² A42B *3/02*

U.S. Cl. 2—424 **6 Claims**



1. A protector for protecting the head, neck and upper chest of a wearer, said protector comprising a rigid outer shell which comprises a head section formed with a cavity wholly to surround the head of the wearer and having a transparent part at the front thereof, a neck section rigidly connected to the head section and formed to surround the neck of the wearer and a chest section rigidly connected to the neck section and formed to extend over the upper chest of the wearer, and a helmet for fitting on the head of the wearer which is located within said cavity in the head section of the outer shell, the cavity being larger than the helmet so that the latter is movable therein and the helmet being suspended in the cavity by a plurality of elongate elements which are attached to the helmet at different locations over its outer surface and are connected to means adapted normally to permit free movement of the helmet in the cavity relative to the outer shell but in the event of the helmet moving relative to the outer shell at an acceleration above a predetermined value, to shock damp movement of the helmet.

3,978,526

PERISCOPE REAR VIEW HELMET AND HELMET ADAPTER

William Leroy Mitchell, 760 Kennebec Court, Bloomfield Hills, Mich. 48013, and John W. Yee, 8870 E. Outer Drive, Detroit, Mich. 48213

Filed Apr. 9, 1975, Ser. No. 566,260

Int. Cl.² A42B *3/02;* **G02B** *5/08*

U.S. Cl. 2—422 **7 Claims**

1. A head helmet comprising: a head protective shell having a crown, a brim extremity defining the top of an open facial area and a frontal area extending downwardly from said crown to said brim extremity; optical means supported on said shell forwardly of said frontal area thereof for reflecting an image line passing forwardly over said crown downwardly to the wearer's eyes to provide a rearward view for the wearer; said optical means including a scanning mirror positioned adjacent said crown for receiving rearward images and reflecting same downwardly, a reflecting mirror positioned adjacent and spaced forwardly of said brim extremity and facing generally upwardly toward said scanning mirror for reflecting the rearward images from said scanning mirror generally upwardly and forwardly, and a viewing mirror positioned above and forwardly of said reflecting mirror and said brim extremity and generally facing rearwardly and downwardly for reflecting the rearward images from said reflecting mirror through the space between said reflecting mirror and said brim extremity and into the open facial area to the wearer's eyes whereby the

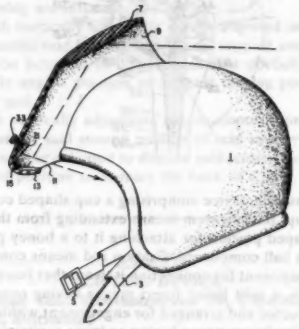


image line between the wearer's eyes and said viewing mirror crosses the image line between said reflecting mirror and said scanning mirror.

3,978,527

HEADGEAR

Vladimir Bednar, Mullerwis 27, 8606 Greifensee (Kt. Zurich), Switzerland

Filed Nov. 25, 1974, Ser. No. 526,712

Claims priority, application Switzerland, Nov. 30, 1973, 16814/73

Int. Cl.² A42B *1/12*

U.S. Cl. 2—68 **5 Claims**

1. A buoyant or protective headgear comprising:

a double-wall cap adapted to fit over the head of a wearer and formed with an inflatable compartment;

a tubular chin strap affixed to said cap at one end thereof and communicating with said compartment for inflation upon inflation of said compartment, said chin strap being adapted to engage a front portion of the head of the wearer in the region of the chin thereof;

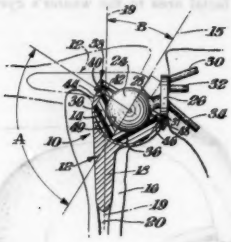
detachable fastening means on the other end of said chin strap and said cap for releasably connecting said other end of said chin strap to said cap; and

valve means communicating with said compartment and enabling inflation and deflation of said cap and said chin strap.

3,978,528
BONE AND JOINT PROSTHESIS

John Anthony Crep, West Nyack, N.Y., assignor to Howmedica, Inc., New York, N.Y.

Filed June 26, 1975, Ser. No. 590,722
Int. Cl.[2] A61F 1/24
U.S. Cl. 3—1.91 14 Claims

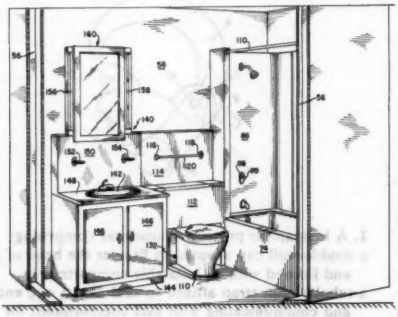


1. A prosthetic device comprising a cup-shaped component having a cup, fixation stem means extending from the base of the cup-shaped portion for attaching it to a boney portion of the body, a ball component, fixation rod means connected to the ball component for connecting it to another boney portion of the body, a split lining insert means having outer dimensions contructed and arranged for engagement within the cup, the split lining insert means having an inner cavity constructed and arranged for reentrantly embracing the ball, an internally flanged locking ring for engaging the outer rim of the cup, the internally flanged locking ring having an aperture through which the ball component is freely inserted, a circular groove above the rim of the cup for snugly receiving the internal flange of the locking ring, and a retaining shoulder within the locking ring for retaining the insert liners and ball within the cup.

3,978,529
POWDER ROOM AND BATHROOM SYSTEM

Kurt Krafft, Prospect, Ky., assignor to Systems Design & Development, Prospect, Ky.

Filed Oct. 15, 1974, Ser. No. 514,807
Int. Cl.[2] A47K 4/00
U.S. Cl. 4—2 8 Claims



1. An assemblage of a plurality of pre-dimensioned and pre-engineered modular units adapted to be assembled to form at least a powder room within a room section of a building structure which comprises:

a. an interface frame adapted to be mounted adjacent to a wet wall portion of the room section, the wet wall portion having a water pipe system extending therethrough and associated with the building water supply, said interface frame being formed of structural frame members dimensioned and configured to be connected in at least one of a plurality of relative positions which define locating positions at least for toilet and lavatory sections;

b. a horizontal support bracket associated with each section defined by said interface frame being connectable to the structural members forming each interface frame section so as to adapt said frame sections to define interface support means at least for modular toilet and lavatory sections;

c. a drain-waste-vent pipe unit adapted to be supported substantially vertically within at least a portion of the wet wall of the room section and adapted to be connected to a drain-waste-vent pipe system of the building structure;

d. drain-waste-vent pipe members adapted to be connected in end-to-end relation and capable of being supported within the interface frame structure to form an interface unit adapted to provide a drain-waste-vent pipe system for the room section;

e. means adapted to connect the vent system of the interface unit to the vent system of the building structure;

f. a modular pre-dimensioned toilet bowl adapted to be supported on the floor of the room section and adapted to be positioned adjacent said horizontal support bracket associated with said toilet section of said interface frame, said toilet bowl defining flush water inlet and waste outlet means at the rear portion thereof;

g. means to secure the rear portion of said toilet bowl to said horizontal support bracket associated with the toilet section of said interface frame and means to connect the waste outlet of said toilet bowl to the waste outlet of said interface unit;

h. a substantially finished shroud member adapted and dimensioned to be selectively removably positioned about at least a portion of said toilet bowl adjacent the toilet section of said interface unit, said shroud member defining a finished wall portion and having means to accumulate flush water therein and control means to selectively release the flush water through an opening defined by a lower portion of said water accumulating means;

i. means to connect the water supply system of the wet wall to said flush water accumulating means to selectively accumulate flush water therein;

j. means to connect the lower opening defined by said flush water accumulating means to the flush water inlet portion of said toilet bowl and resilient means adapted to be positioned within the flush water inlet opening of said toilet bowl and capable of providing a substantially sealed connection between said flush water accumulating means and said toilet bowl;

k. means for supporting towels and the like adapted to be connected to said toilet section of said interface unit in a manner to secure said toilet shroud in adjacent relation with said interface unit comprising:

1. a first elongated member adapted to support towels and the like; and

2. at least first and second support members extending from each end portion of said towel support member and adapted to be extended through the toilet bowl shroud at a location above the toilet bowl position, said first and second support members having means to secure said toilet shroud to said interface unit;

l. a modular cabinet member adapted to be supported on the floor of the room section and to be secured to said lavatory section of said interface unit;

m. a modular wash bowl adapted to be supported on said cabinet member adjacent said lavatory section of said interface unit, said wash bowl having a lower drain outlet means;

n. means to connect the water supply of said wet wall to said modular wash bowl;

o. means to selectively activate and direct water from said water supply to said wash bowl;

p. means to connect the drain outlet means of said wash bowl to the drain system of said interface unit;

q. a substantially finished shroud member adapted to be positioned in adjacent relation against said lavatory section of said interface unit above said cabinet;

r. a dish for soap and the like having fastener means adapted to be extended through said lavatory shroud member in a manner to secure said shroud member to said lavatory section of said interface unit;

s. means adapted to support tooth brushes and the like comprising fastener means adapted to be extended through said lavatory shroud member in a manner to further secure said lavatory shroud member to said lavatory section of said interface unit; and

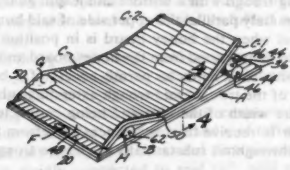
t. a modular cabinet adapted to be positioned adjacent said lavatory section of said interface unit above said modular wash bowl, and means to supportedly position said cabinet on an upper portion of said lavatory shroud, said modular, pre-dimensioned units being capable of being readily assembled to form at least a powder room due to the convenient template provided by said interface unit and drain-waste-vent pipe unit.

3,978,530

AIR INFLATABLE BED-LIKE DEVICE WITH ADJUSTABLE BACK SUPPORT

John G. Amarantos, 6114 Gardenia Ave., Long Beach, Calif. 90805

Filed Nov. 21, 1975, Ser. No. 634,242
Int. Cl.[2] A61G 7/10
U.S. Cl. 5—68 5 Claims



1. An air inflatable bed-like structure that includes:

a. a base assembly that includes an elongate rectangular first envelope of pliable sheet material, which first envelope has a top, bottom, pair of side walls, and first and second end walls; at least one endless resilient restraining tube disposed inside said first envelope that is in abutting contact with the interior surfaces of said first and second end walls and said pair of side walls when said restraining tube is inflated with a fluid; first means for inflating said restraining tube with fluid under pressure; second means for permitting fluid to discharge from said restraining tube to deflate the latter; a plurality of elongate resilient first tubes longitudinally disposed inside said first envelope and within the confines of said restraining tube, said first tubes having first end pieces that cooperate with a portion of said restraining tube to provide a transverse first confined space within said first envelope; third means for discharging air under pressure into said first confined space; first check valve means on said first end pieces that permit air under pressure to flow from said first confined space into said first tubes to inflate the latter; and fourth means for deflating said first tubes;

b. a support assembly that includes an elongate rectangular second envelope of pliable sheet material, which first envelope has a top, bottom, pair of side walls, and first and second ends; a plurality of resilient inflatable second tubes transversely disposed side by side in said second envelope, each of said second tubes having a pair of end walls; a pair of pliable headers that extend longitudinally relative to said second envelope; fourth means for discharging air under pressure into said pair of headers; second check valve means on said end walls for permitting air under pressure in said headers to flow into said second tubes to inflate the latter; fifth means for discharging air from said headers to deflate the latter; sixth means for discharging air from said second tubes to deflate the latter; and seventh means intermediate said first and second ends of said second envelope for bonding the bottom of the latter to the top of said first envelope, with said seventh means so securing said second envelope that first and second longitudinally spaced portions of said support assembly may be moved upwardly relative to said base assembly when both said base assembly and support assembly are inflated;

c. eighth vertically adjustable means disposed on said base and under said first portion of said support assembly that may be actuated to dispose said first portion in an upwardly angled position to support the leg portions of a user; and

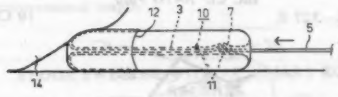
d. ninth vertically adjustable means disposed on said base and under said second portion of said support assembly that may be actuated to dispose said second portion at an angled position to support the back of a user.

3,978,531

LIFTING DEVICE

Bengt Erland Ilon, Benzeholzstrasse 39, CH-6045 Meggen, Lucerne, Switzerland

Filed Mar. 25, 1975, Ser. No. 561,976
Claims priority, application Sweden, Apr. 1, 1974, 7404343
Int. Cl.[2] A47B 83/04
U.S. Cl. 5—81 R 10 Claims



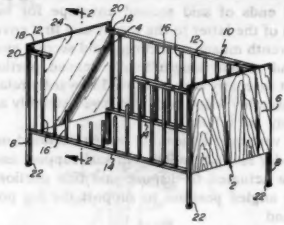
1. A device for lifting an object comprising, a hollow member of thin, flexible material, said member having ends and having a recess extending entirely through the member from one end to the other, said recess being open at each end of the member, said member having an inner portion surrounding and defining said recess and an outer portion surrounding said inner portion and defining the exterior surface of said member, said inner and outer portions defining an enclosed chamber in said member, said chamber surrounding said recess and having a generally elongated, flattened, toroidal configuration, said inner and outer portions of said member forming a continuous, uninterrupted surface, and a protecting means coupled with said member, said protecting means being hollow and having inside and outside surfaces, said protecting means being engageable both with said recess and with the exterior of said member to cover and protect the same, said inside and outside surfaces of said protecting means being inverted when in engagement with the exterior of said member, whereby rolling of said member in a lifting direction causes the inner portion of said member to move to the outer portion and causes part of said protecting means to move from within said recess to the exterior of said member, part of said inside surface of said protecting means thereby becoming everted to face outwardly and to cover an ever increasing area of the exterior of said member.

3,978,532

CRIB INCLUDING REFLECTIVE SURFACE

Gloria Scheiner, 81 Meadowbrook Road, Randolph, N.J. 07801

Filed Feb. 23, 1976, Ser. No. 660,483
Int. Cl.² A47D 7/00; A47C 31/00
U.S. Cl. 5—93 R 8 Claims



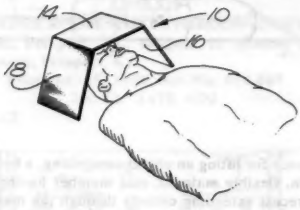
1. A crib comprising a pair of opposing end members and a pair of opposing side members attached to each of said end members, so that said end members and said side members form an enclosure, wherein at least one of said end members comprises a reflective face so that an infant within the said enclosure can observe his image upon said reflective face.

3,978,533

DEVICE FOR RETAINING FACE WARMTH

Henry B. Warner, 1956 Gillilan St., Placentia, Calif. 92670

Filed Apr. 29, 1974, Ser. No. 464,883
Int. Cl.² A47G 9/00
U.S. Cl. 5—327 R 10 Claims



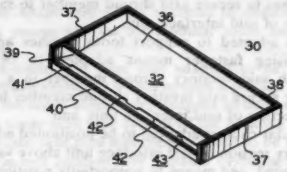
1. A device for retaining face warmth, formed of an integral, one-piece, generally planar blank of rigid material having a metallized surface on at least one planar side, said blank being cut and scored to provide a plurality of walls for folding towards said metallized surface, the edge portions of non-adjacent walls in said blank, which abut when said structure is fully folded, being formed in combination with interlocking tabs and slots, said walls comprising a rear wall hingedly connected along a score line to at least one of said other walls, said other walls being foldable respective each other at said rear wall to form a self-supporting enclosure for a human head, said rear wall having a horizontally central extent approximating the perimeter dimension of a human head, said rear wall having a bottom edge of about 15-26 inches, the width dimension of said rear wall tapering from its bottom edge to at least a region above said central extent, the dimension of said rear wall at said region being about 10-13 inches.

3,978,534

BEE FEEDER

Harry N. Mihos, 110 W. 3rd South, Salt Lake City, Utah 84110

Filed May 19, 1975, Ser. No. 578,399
Int. Cl.² A01K 53/00
U.S. Cl. 6—5 6 Claims



1. Feeding apparatus for mounting in a beehive beneath the roof of the hive and directly above frames suspended therein, comprising:

a. a honey board member constituting a ceiling for the hive and provided with an access port which opens into the space immediately above the frames when said honey board is in position atop the hive;

b. a reservoir chamber mounted to the underside of said honey board so that when the honey board is in position atop the hive, the reservoir will extend substantially the entire width of the hive across the frames, said reservoir constituting means for receiving fluid substances introduced through said access port; and

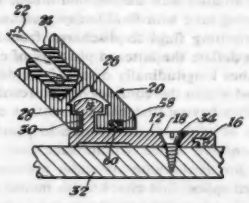
c. a feeding trough with a bottom and a spill guard lip both approximately parallel the upper side of said honey board such that when the honey board is in position atop the hive, said lip is spaced from the honey board and the walls of the hive sufficiently to permit access of a bee to the interior of the trough, said trough extending substantially the entire width of the hive and being connected to said reservoir to receive fluid substances therefrom for distribution throughout substantially the entire trough.

3,978,535

BOAT WINDSHIELD MOUNTING DEVICE

Arnold H. Swan, Lake Worth, and Eugene C. Beals, Hallandale, both of Fla., assignors to American Marine Products, Inc., Fort Lauderdale, Fla.

Filed June 23, 1975, Ser. No. 589,205
Int. Cl.² B63B 17/00
U.S. Cl. 9—1.5 5 Claims



1. A boat windshield mounting device for mounting the windshield of a boat to a boat deck comprising:

an elongated metal strip having a first and second lateral edge, said strip including a plurality of apertures spaced apart and longitudinally disposed near said first edge for receiving fasteners and unitarily constructed therewith a raised vertically disposed flange having a T-shaped cross-section disposed near said second lateral edge of said strip, said flange running the length of said strip;

a boat windshield frame member, said frame member including a T-shaped groove disposed along its bottom side, said raised flange interlockably receivable into said frame member groove, said first lateral edge sized to project beyond said frame member exposing said apertures; and a

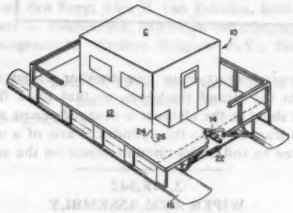
plurality of fasteners receivable through said strip apertures and fastenable to said deck from a single direction.

3,978,536

COLLAPSIBLE WATERCRAFT

Ronald D. Howe, 1330 Fourth St., Red Bluff, Calif. 96080

Continuation of Ser. No. 420,455, Nov. 30, 1973, abandoned.
This application July 25, 1975, Ser. No. 598,981
Int. Cl.² B63B *7/02*
U.S. Cl. 9—2 C **1 Claim**



1. A collapsible watercraft which comprises

a raft having two hingedly connected sections foldable between an operative extended substantially flat horizontal disposition and a downwardly folded collapsed disposition,

a rigid living unit having a substantially flat bottom arranged to rest on said foldable raft over its hinged connection in its extended disposition, and

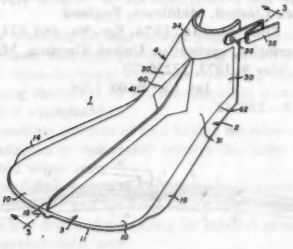
holding means including cables connected between the outer sides of said living unit and said raft sections to hold said raft rigidly in its extended disposition and said living unit rigidly connected to said raft, said cables and said rigid living unit constituting the sole means for holding said raft rigidly in its extended disposition.

3,978,537

SWIM FIN INCLUDING MEANS FOR MAINTAINING FOOT AND LEG IN FIXED RELATIONSHIP

Ralph B. Shamlian, San Francisco, Calif., assignor to Farallon Industries, Inc., Belmont, Calif.

Filed Jan. 14, 1975, Ser. No. 540,908
Int. Cl.² A63B *31/12*
U.S. Cl. 9—309 **13 Claims**



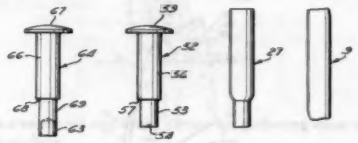
1. A foot mounted swim fin adapted for fitting to the individual legs of a wearer in such a manner that the wearer is able to manipulate his or her legs independently of each other comprising in combination: a foot-receiving portion including a pocket for receiving at least the forward end, including the toes of a wearer's foot; a blade having an upper forward thrust surface extending forwardly from said foot-receiving portion and a leg-bracing portion with means for attachment to a leg extending rigidly from said foot-receiving portion at a predetermined fixed angle for preventing deflection of said foot-receiving portion relative to said leg-bracing portion when forward thrust-producing hydrodynamic forces act on said upper surface of said blade.

3,978,538

METHOD FOR MAKING SHOULDERED TUBULAR RIVETS

Paul A. Fick, Fremont, Ohio, assignor to The National Machinery Company, Tiffin, Ohio

Filed Nov. 1, 1974, Ser. No. 519,925
Int. Cl.² B21K *1/60*
U.S. Cl. 10—27 E **8 Claims**



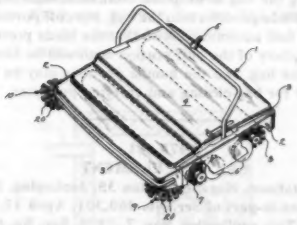
1. A method of forming shouldered tubular rivets comprising in a first operation trapped extruding a blank to reduce the diameter of one end thereof thereby forming an extruded portion and squaring the opposite end, in a second operation confining the entire shank including the extruded portion and squaring said one end and producing a shank of predetermined volume, and thereafter upsetting a head on the opposite end whereby variations in volume of said blank appear as variations in the volume of said head, and in a third operation forward extruding a tubular portion on said one end to a predetermined length.

3,978,539

FLOOR SWEEPER WITH AUXILIARY ROTARY BRUSHES

Robert A. Yonkers, Grandville, Mich., assignor to Bissell, Inc., Grand Rapids, Mich.

Filed June 30, 1975, Ser. No. 591,870
Int. Cl.² A47L *11/33*
U.S. Cl. 15—42 **14 Claims**



1. A carpet sweeper comprising:

a. a frame,

b. means for supporting said frame for reciprocable translation over the floor,

c. transversely extending brush roller means,

d. at least one generally inverted cup-shaped circular auxiliary brush disposed at and extending beyond a forward corner of said frame and adapted to engage the floor, and

with said auxiliary brush being rotatable about an axis which is inclined from the vertical,

e. said auxiliary brush being fixed against substantial movement along said axis,

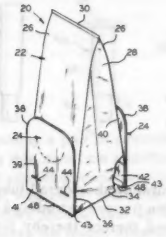
f. and means mounted beneath said auxiliary brush to bias the brush bristles in a direction away from the floor upon the application of downward force on the sweeper to thereby keep the friction between said auxiliary brush and the floor generally equalized.

3,978,540

DISPOSABLE PICK-UP CONTAINER FOR ANIMAL LITTER

Bernard W. Peck, 4711 N. Lawndale Ave., Chicago, Ill. 60625, and Larry P. Horist, 2709 Simpson St., Evanston, Ill. 60201

Filed Mar. 24, 1975, Ser. No. 561,110
Int. Cl.² A47L *13/52*
U.S. Cl. 15—104.8 **10 Claims**



1. A disposable pick-up container for animal litter and which comprises,

an open-mouthed bag of flexible material serving as a receptacle for animal litter and having a cuff portion around the mouth thereof, and

a pair of scoops located outside said bag on opposite sides thereof, said scoops each having a blade portion fixed to the cuff portion of said bag at a predetermined position thereon and a handle portion extending from the blade portion, the said positions and the relative dimensions of the blade portions and the periphery of the cuff portion being such that when the container is manipulated to pick up animal litter, by grasping the handle portions of said scoops, placing the mouth of the bag around the litter, bringing the blade portions of said scoops together under the litter, picking up the litter by the blade portions, upending the bag to drop the litter thereinto, and inserting the blade portions into the bag, the cuff portion of the bag will fold automatically so that the blade portions and the periphery of the cuff portion both will lie completely within the bag, and the handle portions may be brought together for bag-closing and carrying purposes.

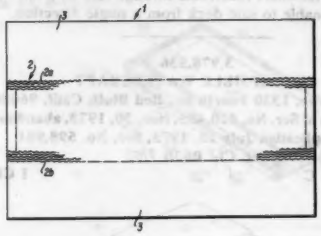
3,978,541

DRY MOP ELEMENT

Gunnar Gustafsson, Hogabergsgatan 35, Jonkoping, Sweden

Continuation-in-part of Ser. No. 460,301, April 12, 1974, abandoned. This application Nov. 7, 1975, Ser. No. 629,699
Int. Cl.² A47L *13/20*
U.S. Cl. 15—229 A **9 Claims**

1. An element for use a dry mop, dry duster or the like adapted for one-time use and for fastening on a mop head or mop holder, said structure comprising a foundation consisting of a thin flexible sheet of non-woven material having low moisture absorption capacity, and a multitude of strands arranged in substantially parallel lines extending parallel to the length of said foundation sheet, characterized in that the strands consist of soft, fibrous material of substantially cylindrical cross section having a far greater thickness than the foundation sheet, and glue strips engaging a limited part of the circumference of the cylindrical strand and fastening each strand to the sheet in substantially tangential relation thereto, said strips positioning said strands in flush engagement with the sheet continuously along the entire length of the sheet and



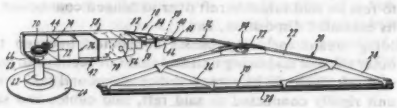
laterally spaced apart from one another a distance corresponding to the strand thickness, so that upon flexing said foundation sheet as the element is dragged across a surface in a direction transverse to the cylindrical axis of a strand, said strand is free to roll on its circumference on the surface.

3,978,542

WIPER ARM ASSEMBLY

Alex H. A. M. van Eekelen, Hasselt; Albert J. G. Hoebrechts, Bovelingen, and Johan H. van den Berg, Hasselt, all of Belgium, assignors to Monroe Belgium N.V., Sint-Truiden, Belgium

Filed Apr. 29, 1974, Ser. No. 465,293
Int. Cl.² B60S *1/08*
U.S. Cl. 15—250.3 **20 Claims**



1. In a wiper arm construction for use in pivotably biasing a wiper blade back and forth across an associated surface relative to a preselected pivotal axis,

means supporting said arm for said pivotal movement, and

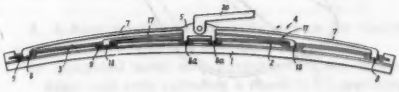
drive means for causing said pivotal movement of said arm, said drive means comprising an electrically energized drive motor mounted on and movable with said arm relative to said pivotal axis.

3,978,543

WINDSCREEN WIPERS

Robert Derrick Tomlin, Hampton Hill, England, assignor to Magnatex Limited, Middlesex, England

Filed Apr. 16, 1974, Ser. No. 461,421
Claims priority, application United Kingdom, Mar. 3, 1970, 10218/70, May 9, 1973, 22230/73
Int. Cl.² B60S *1/04*
U.S. Cl. 15—250.42 **10 Claims**



1. A windscreen wiper comprising a squeegee element and a pressure-distributing harness, moulded of a resilient plastics material, comprising a pair of resiliently flexible arms, flexible

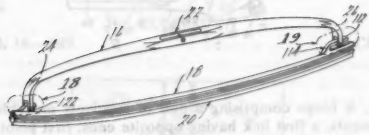
along substantially their entire lengths, extending in opposite longitudinal directions from each side of a substantially rigid central portion adapted for connection of a wiper arm thereto, one arm of each pair being shorter than the other and including claws depending by fixed distances from adjacent said central portion and from the free ends of the arms respectively, said claws being connected to the squeegee element respectively adjacent its centre and its opposite ends, and said arms being biassed over substantially their entire lengths to cause the wiping edge of the squeegee element, when unrestrained, to be curved along its length.

3,978,544

WINDSHIELD WIPER CONSTRUCTION

Johan H. van den Berg; Alex H. van Eekelen, both of Hasselt, and Albert G. Hoebrechts, Mechelen-Bovelingen, all of Belgium, assignors to Monroe Belgium N.V., Sint-Truiden, Belgium

Filed Jan. 30, 1974, Ser. No. 438,038
Int. Cl.² B60S *1/04*
U.S. Cl. 15—250.42 **9 Claims**



1. A windshield wiper blade construction fabricated in part of a molded polymeric material and comprising,

an elongated flexor section adapted to operatively support a wiper element,

said flexor member comprising a generally hollow tubular-shaped body of varying wall thickness, with the exterior of said body being of a semi-cylindrical cross-sectional shape for providing an anti-windlift surface and the interior of said body defining an elongated cavity adapted to receive the mounting portion of said wiper element in a manner such that the wiping lip portion thereof projects outwardly away from said anti-windlift surface on said body, a one-piece bridge member having opposed end portions secured to longitudinally spaced portions of said flexor section and an intermediate portion adapted to be operatively secured to an associated wiper arm or the like,

the major portions of said bridge member between said intermediate and end portions being of a substantially circular cross-sectional shape for reducing the effect of air passing thereover to lift the assembly away from an associated windshield,

said intermediate portion of said bridge member defining a cavity adapted to removably receive the outer end of an associated wiper arm,

means extending between the interior of said cavity and said wiper arm outer end for connecting said bridge member to said wiper arm and providing for relative pivotal movement therebetween, and

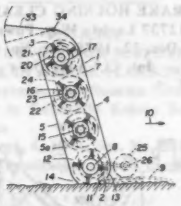
means connecting at least one end of said bridge member to said flexor member, whereby to permit said flexor member and wiper element supported thereon to shift longitudinally of said bridge member to accommodate for windshields of varying configurations.

3,978,545

SWEEPING AND LIFTING DEVICE FOR GATHERING CUT GRASS AND THE LIKE

Jean Alexandre Morel, 5 Rue de Malherbe, 76100 Rouen (Seine-Maritime), France

Continuation of Ser. No. 428,417, Dec. 26, 1973, abandoned. This application July 8, 1975, Ser. No. 594,028
Claims priority, application France, Dec. 26, 1972, 72.47153
Int. Cl.² E01H *1/04*
U.S. Cl. 15—83 **12 Claims**



1. In a sweeping and lifting device for gathering loose matter from a surface

a. a hollow; inclined, essentially rectangular body having, front and rear and side walls and upper and lower ends which are open;

b. a rotating base member disposed in said body at the lower end thereof operative to contact the surface and the loose matter, and to sweep the matter from the surface and throw it up in the said body;

c. at least two rotating upper members disposed one above the other in said body above said base member each said upper member being operative to receive the matter thrown up by the member disposed below, and further throw the matter upward, the uppermost member ejecting the loose matter from said body; and

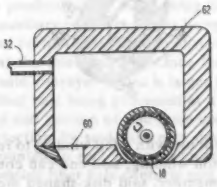
d. means for rotating said base and upper members in the same direction.

3,978,546

APPARATUS FOR CLEANING BACK SURFACE OF MAGNETIC TAPE

August P. Epina, Boulder; Dennis R. Olmsted, Broomfield; Sanford Platter; Robert J. Jones, both of Boulder, and Jack L. Marion, Lafayette, all of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Apr. 3, 1975, Ser. No. 564,683
Int. Cl.² B08B *5/04*
U.S. Cl. 15—306 A **11 Claims**



11. Apparatus for removing foreign matter from a surface of a length of moving magnetic tape, comprising:

a substantially rigid body means defining a cavity therein and adapted to be mounted adjacent the path of the tape;

a cylindrical cleaning means for bearing against the surface of the tape and rotatably mounted in said body, at least part of said cleaning means extending within said cavity, said cleaning means having a resilient, porous outer sur-

face for engaging foreign matter disposed on the surface of the tape;

blade means attached to said body means in spaced relationship to said cleaning means and having a sharpened edge oriented in the path of the tape for scraping foreign matter from the surface of the tape;

said body means defining an aperture between said blade means and said cleaning means; and

means for coupling said cavity to a source of negative pressure.

3,978,547

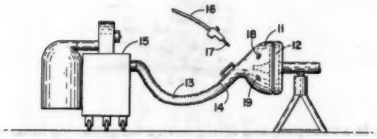
BRAKE HOUSING CLEANER

Las F. Lawson, 12737 Lavista Way, Poway, Calif. 92064

Filed Dec. 22, 1975, Ser. No. 643,150

Int. Cl.² A47L 5/14

U.S. Cl. 15—345 2 Claims



1. A brake housing cleaner comprising a rigid, substantially curvilinear-shaped bonnet having a first opening adapted to fit snugly over a brake housing, said first opening being provided with a rim member of rubbery material extending inwardly and smaller than the circumference of said first opening, a second opening from the wall of the bonnet and defining a circumference adapted for connection to vacuum means, and a plurality of apertures in the wall of said hood, each of said apertures being provided with a cover of a rubbery material through which an air nozzle is insertable to effect a resiliently snug fit between the outside wall of said nozzle and said rubbery material.

3,978,548

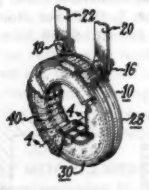
END CAP FOR PRIMARY WINDINGS

Robert S. Canney, Berwick, Maine, assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 523,255, Nov. 13, 1974, Pat. No. 3,925,744. This application July 29, 1975, Ser. No. 600,036

Int. Cl.² F16L 11/10

U.S. Cl. 16—109 4 Claims



1. An end cap for use with a foil winding to relieve electrical stresses on such foil winding, said end cap comprising;

a disk-shaped member, said disk-shaped member having a central opening therein conforming to the opening of a foil winding, the external and internal surface diameters of said disk-shaped member being provided with radii of curvature for relieving electrical stresses on the sharp edges of a foil winding, four tongues substantially identical in configuration spaced 90 degrees from one another and each having an arcuate width at least four times greater than their radial width, each of said tongues extending from one side of said central opening of the disk-shaped member in a direction substantially perpendicular to one of the generally flat sides of the disk-shaped member and extending beyond said one side a distance substantially equal to the thickest part of said disk-shaped member measured from said one side axially therethrough to its opposite side and a pair of blind recesses on said opposite side of said disk-shaped member.

3,978,549

CONCEALED FURNITURE HINGE

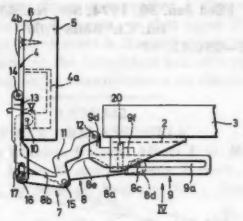
Theodor Vitt, Porz-Eil, Germany, assignor to Prameta Prazisionsmetall- und Kunststofferzeugnisse G. Baumann & Co., Cologne, Germany

Filed Dec. 4, 1974, Ser. No. 529,376

Claims priority, application Germany, Dec. 12, 1973, 2361748; Feb. 11, 1974, 2406439

Int. Cl.² E05D 3/06

U.S. Cl. 16—129 18 Claims



1. A hinge comprising a pair of relatively movable hinge elements, a first link having opposite ends, first pivot means for pivotally connecting a first end of said first link to one of said hinge elements, means for slidably connecting a second end of said first link to the other of said hinge elements, a second link having opposite ends, second pivot means for pivotally connecting a first end of said second link to said one hinge element, third pivot means for pivotally connecting a second end of said link to the other of said hinge elements, said second link having first and second link arms, means articulately connecting said first and second link arms to each other, fourth pivot means between said articulate connecting means and said third pivot means for pivotally connecting one of said link arms to said first link between said first pivot means and said slidable connecting means, said articulately connecting means includes an elongated slot in one of said first and second link arms, fifth pivot means carried by the other of said first and second link arms, and said fifth pivot means being disposed in said slot for relative sliding motion during relative movement of said hinge elements.

3,978,550

HINGE DISCONNECT MEANS FOR A DOOR

William J. Brown, Naperville, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 9, 1975, Ser. No. 585,144

Int. Cl.² E05D 1/06

U.S. Cl. 16—171 7 Claims

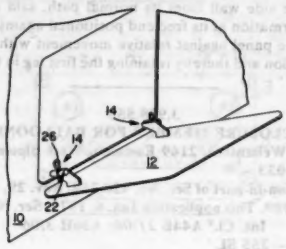
1. A hinge assembly for connecting first and second members comprising:

first arm means pivotally connected relative to the first member;

second arm means secured to the second member; and

means interconnecting the first and second arm means for detachably securing the first arm means relative to the second arm means, so that the second member, second arm means and first arm means are pivotable generally together relative to the first member with the first arm means so secured relative to the second arm means;

wherein the means interconnecting the first and second arm means comprise a tubular portion defined by one of said first and second arm means, the end portion of the other



of said first and second arm means being positionable within the bore of the tubular portion, and means for securing the end portion within the tubular portion.

3,978,551

DOOR CLOSER HINGE

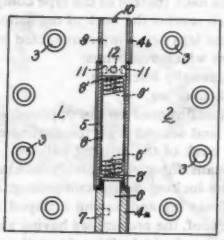
Mitsuo Mochizuki, 3-10 Kamikosaka-cho, Higashi-Osaka, Japan

Filed June 5, 1975, Ser. No. 584,161

Claims priority, application Japan, Nov. 14, 1974, 49-138372

Int. Cl.² E05F 1/1

U.S. Cl. 16—189 **1 Claim**



1. A hinge assembly comprising, in combination, a pair of hinge plates (1, 2), means (3) on said hinge plates for mounting the hinge assembly between a closure and closure-opening, one of said hinge plates including integral, with one side edge thereof two axially spaced cylindrical, axis portions (4*a*, 4*b*), the other of said hinges plates including integral at one edge thereof a central, cylindrical axis portion (5) in coaxial alignment with the axially space cylindrical portions of said one plate and forming therewith an axial sleeve extending the height of the adjacent edges of the plates on which the cylindrical axis portions are formed; a first hinge pin (6) projecting into and contained within the cylindrical axis portion (4*a*) of said one hinge plate having a terminal end and within one end of said cylindrical axis portion of the other plate, said first hinge pin having a transverse bifurcation (6') at the terminal end; lock means (7) extending through the cylindrical axis portion (4*a*) of the one plate and extending into and anchoring the pin (6) against rotation therein; a coil spring (8) having one transverse end (8') seated in the bifurcation (6') of said pin, said coil spring extending substantially the length of the central cylindrical axis portion of the other hinge plate; a second hinge pin (9) disposed completely within the other cylindrical axis portion (4*b*) and having a bifurcated terminal end (9') projecting into the central cylindrical axis portion (5) of the other of said hinge plates, said second hinge pin having a plurality of radially opening, circumferentially spaced recess portion (11), said second hinge pin having a transverse kerf (10) exposed at the end of the cylindrical, axis portion in which said second hinge pin is hidden, said cylindrical axis portion of said other plate in which the coil spring is disposed having a transverse opening (12) alignable with at least one of the radially, opening recesses in said second hinge pin; and fastener means removably secured in the transverse opening and one of the radially opening recesses (11) for retaining the hinge assembly in assembled relationship and permitting the second hinge pin to be rotated at said kerf to impose residual, closing-torque in the hinge and maintain it while the hinge is assembled and while on a closure and closure-opening.

3,978,552

METHOD AND DEVICE FOR SUPPLYING A FRESH COTTON BALE IN A BALE PLUCKING MACHINE

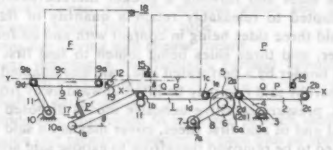
Hidejiro Araki, Toyoake, and Susumu Ōtani, Obu, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Japan

Filed Sept. 4, 1974, Ser. No. 502,924

Claims priority, application Japan, Sept. 10, 1973, 48-101949

Int. Cl.² D01G 7/04

U.S. Cl. 19—80 R **8 Claims**



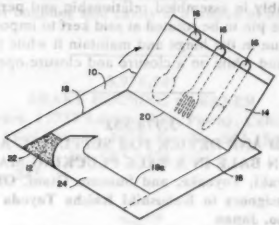
2. In a bale plucking machine comprising a pair of main conveyer means disposed at an identical level with an intervening space therebetween, and a plucking roller disposed in said intervening space, means for driving said main conveyer means to and fro so that a bale is reciprocally displaced between two ends thereof, end detecting means disposed at respective positions adjacent to said ends of said main conveyers so that the arrival of a fiber bale at each of said ends is detected, means for changing the driving direction of said driving means alternately according to signals from said detecting means, a device including an auxiliary conveyer means for supplying a fresh fiber bale onto one of said main conveyer means, one of said main conveyer means being provided with a downwardly inclined end portion extending from said end, thickness detecting means for detecting the thickness of the fiber bale being processed, said thickness detecting means being disposed at a position above the level of the base of said fiber bale at a predetermined intervening distance (*l*) from said base, said auxiliary conveyer means being disposed above said inclined end portion of said main conveyer means in such a condition that the intervening distance from said inclined end portion of said conveyer means is larger than *l*, means for stopping said fiber bale being processed at a waiting position on said inclined end portion of said main conveyer means in response to detection by said thickness detecting means, a limit switch mounted to said stopping means, and operable when said processing fiber bale contacts said stopping means, means for driving said auxiliary conveyer means by a signal issued from said limit switch, and means for actuating said driving means of said main conveyer means in response to the arrival of a forward end of a fresh fiber bale at a forward end of the waiting fiber bale being processed, while located at said waiting position, and means for stopping said auxiliary conveyer means when a said fresh fiber bale is displaced onto said fiber bale positioned on said inclined portion of said conveyer means.

3,978,553

NAPKIN

Edith M. Honig, Miami Beach, Fla., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Feb. 6, 1976, Ser. No. 655,709
Int. Cl.[2] A45F 5/04
U.S. Cl. 24—7 5 Claims



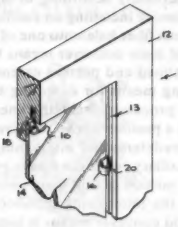
1. A napkin especially adapted to be adhesively retained on the clothing of the user, comprising a first sheet of pliable material, said first sheet having a border defining a substantially centrally disposed flap section, said flap section including at least two layers of opposing second sheets joined on at least three sides and forming a pocket therebetween, said pocket adapted to releasably retain a quantity of flatware therein, said three sides being in contact with and co-forming said border, said three sides being joined to said first sheet along said border by a perforated line, said line adapted to be broken whereby said flap may be lifted upward away from the first sheet, pressure sensitive adhesive means disposed along one lateral end of said first sheet, cover means on said adhesive adapted to be removed therefrom to expose said adhesive layer, said adhesive layer being adjacent one end of said flap.

3,978,554

SPRING CLIP FASTENED PANEL AND FRAME ASSEMBLY

Samuel Miller, Jr., 4106 Camelot, Memphis, Tenn. 38118

Filed Mar. 27, 1975, Ser. No. 562,781
Int. Cl.[2] A44B 21/00; E06B 3/32
U.S. Cl. 24—73 B 2 Claims



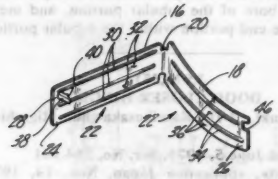
1. A spring clip fastened panel and frame assembly for furniture and the like, said assembly comprising a frame having frame members defining a recess bounded by inwardly facing edge surfaces of the frame members and a support lip extending inwardly from at least one of said edge surfaces, a panel smaller than the recess positioned in the recess and against the suppport lip, the frame members having a groove extending into at least one of said edge surfaces having front and rear groove side walls, and at least one spring clip fastener having a first leg positioned in said groove along an approximately diagonal path inclined to the plane of the groove, a second leg and an arcuately curved convex intermediate portion integrally joining the second leg to the first leg, the first leg having a distal portion spaced inwardly of the groove from the entrance to the groove bearing against the rear groove side wall and having a proximal portion abutting the front groove side wall at the entrance of the groove and stressed toward the rear groove side wall from its normal path, said second leg having a formation at its free end positioned against the panel to retain the panel against relative movement with respect to said formation and thereby retaining the first leg in the groove.

3,978,555

CLOSURE MEMBER FOR BALLOONS

Marvin L. Weisenthal, 2169 Eastman, West Bloomfield Hills, Mich. 48033

Continuation-in-part of Ser. No. 420,264, Nov. 29, 1973, Pat. No. 3,900,989. This application Jan. 6, 1975, Ser. No. 538,809
Int. Cl.[2] A44B 21/00; A36H 3/06
U.S. Cl. 24—255 SL 3 Claims



1. In a closure member for sealingly closing an inflated balloon about the neck thereof of the type comprising first and second legs which receive the neck of the balloon transversely therebetween, the legs being interconnected by hinge means, the improvement which comprises:

a. a first substantially linear leg,

b. a second arcuate leg,

c. sealing means disposed on the opposed interior surfaces of the first and second legs, the sealing means sealingly closing the neck of the inflated balloon,

d. locking means for compressively locking the two legs together, the locking means comprising: a leg extending from the linear leg and having a sloped shoulder at the free end thereof, the arcuate leg having a cut-out portion, the inner edge of which slides down the sloped shoulder until it engages the undersurface thereof, the locking means and cut-out portion being positioned to one side of a longitudinal line through the center of the closure member so as to provide a pull tab on the arcuate leg, the pull tab flaring away from the free end of the linear leg to facilitate release of the closure member from its locked condition, and

wherein locking of the legs causes the sealing means to compressingly seal the balloon across the neck thereof to prevent the passage of fluid therefrom.

3,978,556

PROCESSING SYSTEM FOR WOVEN, KNIT OR SIMILAR SHAPED MATERIALS

Masao Masuda, Nagoya, Japan, assignor to Masuda Manufacturing Co., Ltd., Nagoya, Japan

Filed Dec. 5, 1974, Ser. No. 529,970
Int. Cl.[2] D02C 3/00
U.S. Cl. 68—62 19 Claims

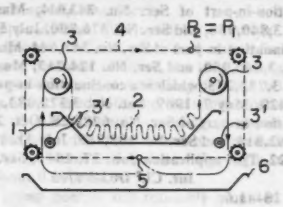
1. A processing system for woven, knit or similarly shaped materials, comprising:

at least one processing section with a processing bath;

an elongated moving material guidance device passing completely through the at least one processing section and;

a material attachment device which is mounted above the bath on the guidance device and oriented transversely relative to the direction of movement of the guidance

device and movable with the guidance device for engaging a material to be processed and moving the material through the at least one processing section according to the motion of the guidance device



an initial material feeding device for feeding material to the material attachment device; and

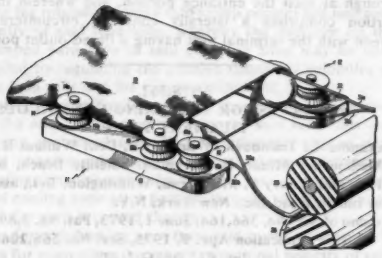
final material take-out and carrier-transporter devices operatively coupled to the material guidance device.

3,978,557

APPARATUS FOR SPREADING AND GUIDING A TUBULAR FABRIC

Sam M. Goodson, 1107 Fleetwood Drive, Lookout Mountain, Tenn. 37350

Filed May 12, 1975, Ser. No. 576,381
Int. Cl.² D06C 5/00
U.S. Cl. 26—84 **7 Claims**



1. Apparatus for spreading and guiding a tube of fabric comprising:

six contoured sheave means each of which is rotatable about a substantially vertical central axis,

two pair of free turning bodies, one body of each pair being associated with a respective one of the sheave means and the other body of each pair being associated with a respective pair of the sheave means on each side of the spreading apparatus,

means to establish a magnetic attraction between each body and its respective sheave means,

means supporting said sheave means in mutually spaced relationship in two groups of three sheave means each on each side of the spreading apparatus with a pair of the three being longitudinally spaced from the remaining one of the three so as to accommodate an open tube of fabric therebetween with the bodies inside and the sheave means outside the fabric tube,

means for driving said sheave means, and

a guide bar means connected to each pair of free turning bodies, each guide bar means comprising a pair of elongated guide bars which are connected to opposing portions of a respective pair of free turning bodies, each of said guide bars being a mirror image of the other on each side of a substantially horizontal plane which passes through the mid-portion of the free turning bodies, each guide bar being in contact with the other guide bar of the pair at each end thereof and extending from its contact with the other guide bar progressively away from the other guide bar and inwardly in a direction toward the other pair of guide bars to its connection with one of the pair of respective free turning bodies, being substantially straight between its respective pair of free turning bodies and then extending from its connection with the other one of the pair of respective free turning bodies progressively toward the other guide bar and outwardly in a direction away from the other pair of guide bars to its contact with the other guide bar.

6. Apparatus for spreading and guiding a tube of fabric comprising:

six contoured sheave means each of which is rotatable about a substantially vertical central axis,

two pair of free turning spheres, one sphere of each pair being associated with a respective one of the sheave means and the other sphere of each pair being associated with a respective pair of the sheave means on each side of the spreading apparatus,

means to establish a magnetic attraction between each sphere and its respective sheave means,

means supporting said sheave means in mutually spaced relationship in two groups of three sheave means each on each side of the spreading apparatus with a pair of the three being longitudinally spaced from the remaining one of the three so as to accommodate an open tube of fabric therebetween with the spheres inside and the sheave means outside the fabric tube,

means for driving said sheave means,

means defining a substantially vertical annular passage through each sphere,

a shaft in each passage,

a guide ring connected to each end of each shaft, and

a guide rod means connected to each pair of spheres, each guide rod means comprising a pair of elongated guide rods which extend through the guide rings for connection to the respective spheres, each of said guide rods being a mirror image of the other on each side of a substantially horizontal plane which passes through the center of the spheres, each guide rod being in contact with the other guide rod of the pair at each end thereof and extending from its contact with the other guide rod progressively away therefrom and inwardly in a direction toward the other pair of guide rods to its connection with one of the pair of respective free turning spheres, being substantially straight between its respective pair of spheres, and then extending from its connection with the other one of the pair of respective spheres progressively toward the other guide rod and outwardly in a direction away from the other pair of guide rods to its contact with the other guide rod.

3,978,558

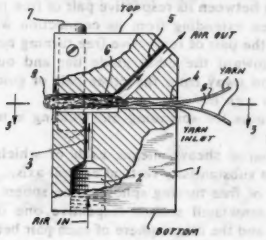
AIR JET YARN ENTANGLEMENT

Herbert J. Pike, Martinsville, N.J., assignor to J. P. Stevens & Co., Inc., New York, N.Y.

Filed Jan. 12, 1976, Ser. No. 647,946
Int. Cl.² D02G 1/16
U.S. Cl. 28—1.4 **6 Claims**

1. An air jet apparatus for the production of entangled yarn comprising a block; a yarn passageway extending therethrough from side to side: means to feed yarn through said passageway: an air inlet duct for introducing air into the passageway, said inlet duct intercepting said passageway at substantially right angles with the longitudinal axis of said inlet passing through or close to the longitudinal axis of the yarn passageway; an air outlet duct intercepting the top of the yarn passageway and slanting upward therefrom and means extend-

ing into said yarn passageway between the air inlet duct and the exit end of the yarn passageway to contact yarn fed



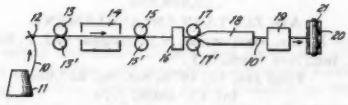
through said yarn passageway and provide resistance to the movement of said yarn.

3,978,559

YARN TREATING APPARATUS

Robert K. Stanley, Media, Pa., assignor to Techniservice Corporation, Kennett Square, Pa.

Continuation of Ser. No. 456,033, March 29, 1974, which is a continuation of Ser. No. 214,893, Jan. 3, 1972, Pat. No. 3,808,654, which is a continuation of Ser. No. 846,457, July 31, 1969, Pat. No. 3,781,952, which is a continuation-in-part of Ser. No. 684,230, Nov. 20, 1967, Pat. No. 3,462,815, Ser. No. 678,428, Oct. 26, 1967, Pat. No. 3,462,814, Ser. No. 606,420, Dec. 30, 1966, and Ser. No. 835,883, June 9, 1969, Pat. No. 3,559,254, said Ser. No. 684,230, and Ser. No. 678,428, each is a continuation-in-part of Ser. No. 302,758, July 31, 1963, Pat. No. 3,376,622, which is a continuation-in-part of Ser. No. 790,658, Feb. 2, 1959, Pat. No. 3,111,740, and Ser. No. 216,524, July 13, 1962, abandoned, said Ser. No. 606,420, is a continuation-in-part of Ser. No. 386,489, July 31, 1964, Pat. No. 3,317,977, which is a continuation-in-part of Ser. No. 216,447, July 13, 1962, Pat. No. 3,145,947, said Ser. No. 835,883, is a continuation-in-part of Ser. No. 650,762, July 3, 1967, abandoned, which is a continuation-in-part of Ser. No. 349,338, March 4, 1964. This application Nov. 11, 1974, Ser. No. 522,424
The portion of the term of this patent subsequent to May 7, 1991, has been disclaimed.
Int. Cl.[2] D02G *1/12*
U.S. Cl. 28—1.6 3 Claims



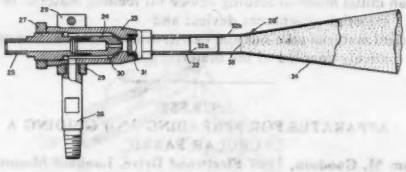
1. Apparatus for treating thermoplastic yarn comprising an internally heated roller, means for advancing the yarn in arcuate contact with the internally heated roller, means for rotating the heated roller in the direction of the winding of the yarn in contact therewith, and means for directly crimping the thus heated yarn.

3,978,560

STRAND TREATMENT APPARATUS

Robert K. Stanley, Media, Pa., assignor to Techniservice Corporation, Kennett Square, Pa.

Continuation of Ser. No. 405,262, Oct. 11, 1973, which is a continuation-in-part of Ser. No. 343,644, March 22, 1973, Pat. No. 3,840,950, and Ser. No. 376,890, July 5, 1973, which is a continuation-in-part of Ser. No. 343,644, March 22, 1973, Pat. No. 3,840,950, and Ser. No. 124,213, March 15, 1971, Pat. No. 3,753,275, which is a continuation-in-part of Ser. No. 822,429, May 7, 1969, Pat. No. 3,570,083, which is a continuation-in-part of Ser. No. 678,428, Oct. 26, 1967, Pat. No. 3,462,814, and Ser. No. 302,758, July 31, 1963, Pat. No. 3,376,622. This application Jan. 27, 1975, Ser. No. 544,293
Int. Cl.[2] D02C *1/12*
U.S. Cl. 28—1.6 8 Claims



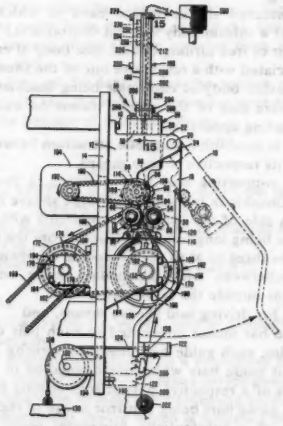
1. Apparatus for crimping textile strands, comprising means laterally confining such strand and having an entrance portion and an open-ended exit portion, means for feeding strand into the entrance portion, jet means for injecting fluid into the entrance portion for forwarding the strand at least partially through at least the entrance portion, and wherein the exit portion comprises a laterally confining circumferentially screen with the terminal part having a flared outlet portion.

3,978,561

APPARATUS FOR TEXTURING CONTINUOUS FILAMENT YARN

Alexander L. Trifunovic, Wilmington, Del.; William H. Hills, Melbourne; Milton H. Borgman, Satellite Beach, both of Fla., and Emory P. Mersereau, Wilmington, Del., assignors to Indian Head Inc., New York, N.Y.

Division of Ser. No. 366,164, June 1, 1973, Pat. No. 3,894,319. This application Apr. 9, 1975, Ser. No. 566,206
Int. Cl.[2] D02G *1/12*
U.S. Cl. 28—1.7 10 Claims



1. A stuffer crimper for crimping continuous filament yarn

having a denier in the range of approximately 40–150, said crimper comprising:

a housing;

a crimping chamber secured to said housing and having a channel extending therethrough, said channel having a generally rectangular transverse cross-section;

means for heating said chamber;

a pair of opposed feed rolls rotatably mounted on said housing adjacent one end of said chamber for feeding yarn into said chamber channel, the long cross-sectional dimension of said channel extending parallel to the rotational axes of said feed rolls and the short cross-sectional dimension of said channel extending perpendicular to said axes, the ratio of said short cross-sectional dimension in inches to the denier of said yarn having a minimum value of about 0.000667;

at least one crimp control roll rotatably mounted on said housing and extending into said chamber channel, the portion of said channel between the feed rolls and the crimp control roll defining a confined crimping zone, whereby continuous filament yarn is fed into said crimping zone by the feed rolls against a core of crimped yarn therein causing the yarn to collapse longitudinally and fold over forming crimps which become part of said core, the crimp control roll being spaced from the feed rolls along said channel a distance no greater than the distance required for the yarn to be plastically deformed and partially set in said crimping zone, the portion of said channel between the crimp control roll and the end of the chamber opposite the feed rolls defining a setting zone, whereby said core is fed into the setting zone by the crimp control roll and the yarn is fully set therein;

means for rotatably driving said pair of feed rolls at the same rotational velocity;

means for rotatably driving said crimp control roll independently of said feed rolls, whereby the pressure on the crimped yarn core in said crimping zone may be controlled by regulating the relative rotational velocities of the feed rolls and the crimp control roll;

a cooling tower affixed at one end thereof to said chamber at the end of the chamber opposite said feed rolls and having a channel extending therethrough aligned with said chamber channel, said tower channel defining a cooling zone, whereby the crimped yarn core is fed into said cooling zone after passage through said setting zone and the yarn is cooled therein;

means for withdrawing yarn from said tower channel and;

means for controlling the relative rotational velocity of said feed rolls and the withdrawal rate of said withdrawing means.

3,978,562

METHOD OF MANUFACTURING A COLOR CATHODE RAY TUBE

Kazimir Palac, Carpentersville, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Division of Ser. No. 446,845, Feb. 28, 1974, Pat. No. 3,935,036. This application May 1, 1975, Ser. No. 573,692

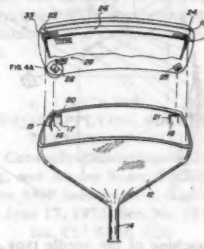
Int. Cl.² H01J 9/18

U.S. Cl. 29—25.15 6 Claims

1. In the fabrication of a rectangular-type color cathode ray tube which comprises an approximately rectangular, flangeless faceplate having a phosphor screen pattern deposited on an inner surface thereof, a funnel having an approximately rectangular mouth adapted to be sealed to said inner surface of said faceplate, and an elongated cylindrical neck sealed to said funnel on the center line of the tube for receiving electron gun means, a method for referencing said screen pattern on said faceplate to an effective source of electron beams generated by the electron gun means, comprising:

providing in at least two interior corner regions of said funnel mouth a total of at least three spaced insided funnel reference surfaces oriented parallel to said center line;

providing in at least two interior corner regions of said faceplate corresponding to said corner regions of said funnel mouth inside referencing means which extend from said inner surface of the faceplate and which define at least three tangentially spaced, axially oriented inside faceplate reference surfaces so located as to engage said inside funnel reference surfaces when the faceplate and funnel are assembled, the engagement of said inside faceplate and funnel reference surfaces uniquely determining and fixing the azimuthal attitude of said faceplate relative to said funnel in a plane generally perpendicular to said center line;



depositing a phosphor screen pattern on said inner surface of said faceplate in a location and with an orientation which bears a predetermined reference to said inside faceplate reference surfaces;

attaching said neck to said funnel with the neck center line oriented to bear a predetermined reference to said inside funnel reference surfaces; and

sealing said faceplate to said funnel, including bringing said inside faceplate reference surfaces and said inside funnel reference surfaces into referencing engagement during the sealing operation to thereby reference said screen pattern on said faceplate to said neck center line and thus to the effective source of electron beams generated by electron gun means ultimately mounted on the center line of the neck.

3,978,563

METHOD OF MANUFACTURING AN ELECTRIC DISCHARGE TUBE HAVING AN OXIDE CATHODE

Klaas Schol; Johannes Maria Azalina Antonius Compen, and Reinier Maria van den Heuvel, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 26, 1974, Ser. No. 527,242

Claims priority, application Netherlands, Dec. 4, 1973, 7316554; Oct. 11, 1974, 7413378

Int. Cl.² H01J 9/12

U.S. Cl. 29—25.17 7 Claims

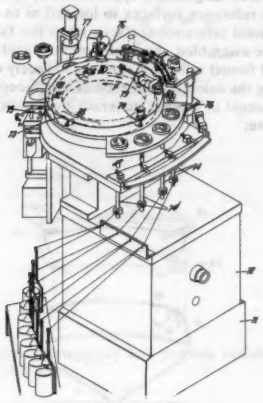
1. A method of manufacturing an electric discharge tube having an envelope of a volume of at least 2 liters, and an oxide cathode, comprising the steps of: preparing a suspension containing a mixture of carbonates; a first binder including nitrocellulose; a second binder including at least one substance selected from the group consisting of polyimides, highly molecular acrylic resins and nylon types, said second binder having a higher resistance than said first binder to withstand impacts of water droplets and resist temperatures up to 450°C for at least a few minutes; coating a cathode support with said suspension, drying the coating at a temperature below 450°C; mounting the cathode in said envelope and evacuating said envelope; and activating the cathode at a temperature above 450°C to convert the carbonates into oxides.

3,978,564

WINDING MACHINE

Eduardo Soler Font, 5 Puigreig St., Barcelona, Spain

Filed Jan. 23, 1975, Ser. No. 543,605
Int. Cl.² B65H 81/06
U.S. Cl. 29—33 F 9 Claims



1. A winding machine of the needle type, particularly for winding stators of electric motors having shaded or universal poles, comprising a circular fixed table, at least two flat coplanar supports arranged at the outer periphery of the table, and a winding mechanism arranged generally below the table and including an even number of winding spindles extending to the vicinity of the plane containing the supports, the supports being alternately displaced around the table independently of each other and according to a predetermined program to a number of preparatory positions and a winding position, each support having arranged therealong as many stations as there are winding spindles, each station being designed to accommodate a stator, the winding mechanisms being adapted to wind simultaneously all the stators accommodated in one support when that support is in the winding position, each support passing through a preparatory position at which each wound stator is removed and an unwound stator substituted therefor.

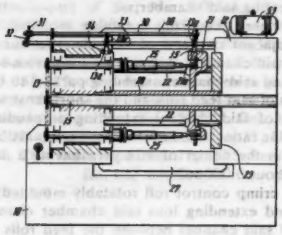
3,978,565

MULTIPLE-SPINDLE MACHINE TOOL

Hermann Flisch, Maienfeld, Switzerland, assignor to Eunipp AG, Zug, Switzerland

Filed Sept. 5, 1974, Ser. No. 503,244
Claims priority, application Switzerland, Sept. 14, 1973, 13195/73
Int. Cl.² B23B 3/32; B23P 23/02
U.S. Cl. 29—38 B 22 Claims

1. In a multiple spindle machine, a combination comprising, a frame having two spaced apart frame members; spaced apart first and second spindle carriers indexible about a common axis and rotatably supported by said frame; a plurality of work spindles mounted in each of said carriers, the axes of said work spindles being parallel to said common axis and each spindle in said first carrier being aligned with a spindle in said second carrier; work engaging devices mounted on the spindles of at least one of said carriers and located in the space between said carriers; means for indexing said spindle carriers in synchronism about said common axis whereby said spindles travel along an endless path; a plurality of elongated guide members extending in parallelism with said common axis between said spaced apart frame members fixed thereto, said guide members including at least one guide member located at the outer side of said path and at least one guide member located at the inner side of said path; tool carriages mounted on and movable with respect to said inner and outer guide members, each of said carriages including a first slide movable



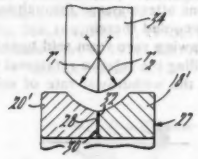
lengthwise of the respective guide member and a second slide mounted on and movable relative to said first slide substantially transversely of the respective guide member, and means to so move said carriages.

3,978,566

PROCESS FOR MAKING SECTIONALIZED PRECISION COMPONENTS

Eli M. Ladin, Ann Arbor, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Continuation-in-part of Ser. No. 444,120, Feb. 20, 1974, Pat. No. 3,871,093. This application Jan. 17, 1975, Ser. No. 541,998
The portion of the term of this patent subsequent to Mar. 18, 1992, has been disclaimed.
Int. Cl.² B23P 11/00, 17/00; B21H 1/12
U.S. Cl. 29—148.4 A 18 Claims



1. In a process for fabricating precision components of the type comprising a member which is of a sectionalized construction including a plurality of sections joined together in assembled condition at an interface defined by a respective parting surface of each section, the steps of forming a plurality of sections having a shape and size such that the assembly thereof at the parting surface of each section substantially defines the sectionalized member, applying a thin film of adhesive to at least one said parting surface at each interface, adhesively securing said sections together at the interface defined by the respective parting surface of each section into a bonded assembly in which the sections are disposed in an assembled relationship corresponding to their ultimate operating disposition, finishing at least some of the surfaces of said bonded assembly including a surface incorporating an exposed edge of said interface to the desired final dimensions and surface finish, and thereafter cleaving said bonded assembly and separating the mated finished said sections.

3,978,567

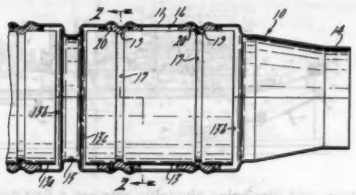
METHOD OF MAKING A CATALYTIC REACTOR FOR AUTOMOBILE

William Riley Vroman, Madison Heights, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Division of Ser. No. 342,575, March 19, 1973. This application Feb. 20, 1975, Ser. No. 551,442

Int. Cl.[2] B23P *15/00*; B01J *8/04*, *35/04*; B29C *15/00*

U.S. Cl. 29—157 R 14 Claims



1. In the method of manufacturing a catalytic reactor, forming a curable plastic to provide a porous monolithic catalyst substrate adapted for axial gas flow therethrough and, before said plastic is completely cured, increasing the density of said plastic adjacent its outer surface at a region thereof around the axis of said gas flow to reinforce said plastic at said region by depressing the outer surface of said substrate at said region, thereafter curing said plastic to provide a hardened substrate for said catalyst, providing a housing of separate form sustaining sections for said substrate adapted to enclose said outer surface in spaced relationship, and supporting said substrate in spaced relationship within said housing by clamping a substrate support transversely of said axis and between said housing sections and said region of said outer surface.

3,978,568

APPARATUS FOR TREATING LIPSTICK AND LIKE SUBSTANCES

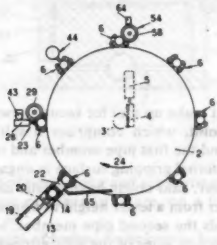
Charles Frydlender, Annecy, France, assignor to SEBEC Societe d'Exploitation de Brevets d'Emballage Cosmetique S.A., Fribourg, Switzerland

Filed June 30, 1975, Ser. No. 592,048

Claims priority, application France, July 11, 1974, 74.24096

Int. Cl.[2] B23F *19/00*

U.S. Cl. 29—200 D 9 Claims



1. A machine for putting into practice the process for removing molds from, and for treating lipsticks and other substances of similar physical cahracteristics cast in individual moulds inside containers of a kind having a body an a base mechanism for projecting the stick by rotation of said body with respect to said base, comprising a fixed structure, a round table rotatable about an axis on said structure, a mechanism for indexing said table angularly step by step and, uniformly distributed around its periphery, a plurality of resilient individual grippers for said containers regularly spaced apart, a plurality of fixed treatment stations spaced around said table and comprising a feed-in station for said containers containing cast sticks in their individual molds, all facing the same direction and parallel to the axis of rotation of the table, said feed-in station comprising means for inserting said containers individually, each in one gripper, by pushing said containers laterally in a radial direction towards the axis of said table, a station for projecting the stick, said projecting station comprising means for rotating relatively the body and the base of said container in a direction such as to project said stick out of said container, a station for ejecting the hold, said mold-ejecting station comprising means for releasing said mold from said stick along the axis of said container and means for ejecting the mold, a station for polishing said sticks by surface treatment, a station for retracting said sticks into said containers, said retracting station comprising means for rotating relatively said body and said base in a direction such as to retract said stick into the container, and a station for ejecting the containers, said container ejecting station comprising means for pushing said containers laterally in a radial direction away from the axis of said table.

3,978,569

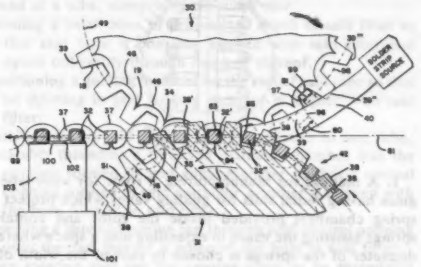
APPARATUS FOR APPLYING SOLDER RINGS TO TERMINAL POSTS

Robert Franklin Cobaugh, Elizabethtown; James Ray Coller, Mechanicsburg, and Attalee Snarr Taylor, Palmyra, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed June 17, 1975, Ser. No. 587,750

Int. Cl.[2] B23K *1/20*

U.S. Cl. 29—203 DS 12 Claims



1. An apparatus for cold working a continuous strip of solder into at least partial rings around a predetermined portion of each post of a strip of posts spaced apart a given distance and in parallel manner upon a common carrier strip and comprising:

first and second rollers having parallel axes of rotation and each roller having on the perimeter thereof a plurality of circumferential tracks which are axially aligned with a given portion of the perimeter of the other roller and which approach a tangential relationship with said given portion at the pitch plane between said rollers;

first and second axially aligned circumferential tracks of said plurality of circumferential tracks on said first and second rollers each comprising a plurality of substantially parallel ridges spaced apart said given distance and having a concave portion therebetween;

the said ridges on one of said rollers being positioned on said rollers to pass through said pitch plane coincidentally with the ridges on the other of said rollers to crimp said strip of solder which is passed through said pitch plane between said first and second tracks at least partially around said predeterined portions of said posts which are also passed through said pitch plane between said first and second tracks;

a third track on said first roller comprising gear teeth with one side thereof adjacent a first common side of said first and second track of ridges;

a fourth track on said second roller comprising gear teeth with one side adjacent the second common side of said first and second track of ridges;

the gear teeth of said third and fourth tracks being circumferentially positioned with their bottom lands coincident when passing through said pitch plane to thereby trap said predetermined portions of said posts between said one side of said gear teeth of said third and fourth tracks, and with their top lands coincident with said ridges.

3,978,570

METHOD OF MANUFACTURING A ROTOR FOR VANE TYPE ENGINES

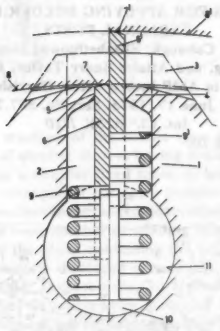
Klaus Winter, Schwalbach, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Aug. 2, 1974, Ser. No. 494,332

Claims priority, application Germany, Aug. 17, 1973, 2341677

Int. Cl.² B23P *15/00*

U.S. Cl. 29—156.4 R **3 Claims**



1. A method for manufacturing a rotor for vane-type engines having radial slots for guiding vanes which project into spring chambers provided inside the rotor and containing springs assisting the vanes in extending into a space where the diameter of the springs is chosen to exceed the width of the slots, comprising the steps of

providing radial bores in rotors to serve as spring chambers,

closing the bores by plastic deformation of rotor material at the surface of the rotor,

providing radial slots which run parallel to the rotor axis to intersect the radial bores, said radial slots being formed in a manner to enable them to serve as guides for vanes and permit movement of the vanes,

providing longitudinal bores running parallel to the rotor axis, in which bores the radial bores terminate, and which form the bottom chambers for the vanes,

placing springs in said radial bores, and

placing vanes in said radial slots.

3,978,571

APPARATUS FOR ASSEMBLING STORAGE BATTERY PLATES AND SEPARATORS

Daniel Orlando, New Berlin, and Chester Misurek, West Allis, both of Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Continuation of Ser. No. 516,172, Oct. 21, 1974, abandoned. This application Apr. 10, 1975, Ser. No. 566,975

Int. Cl.² H01M *2/14*

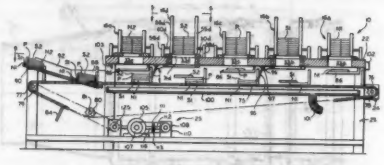
U.S. Cl. 29—204 R **30 Claims**

1. Apparatus for arranging storage battery plates and separators into battery elements, comprising:

loading station means including a plurality of feed means for dispensing battery plates and separators,

conveyor means for receiving said plates and separators from said feed means,

at least one of said feed means comprising a pivotable disc having a first aperture formed therein, and bracket means for maintaining a stack of plates or separators in a horizontally fixed position over said disc and said first aperture, said disc being pivotable between a first position in which said first aperture is aligned with the lower-most member of said stack, and a second position wherein said lower-most member is deposited on said conveyor, means for limiting vertical movement of said stack when said disc is in said first position to permit only the lower-most member of said stack to be received in said aperture.



3,978,572

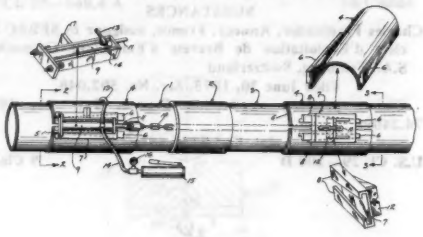
PIPE JOINT MAKE UP TOOL

Robert M. Jackman, Little Rock, Ark., assignor to A. O. Smith-Inland, Inc., Milwaukee, Wis.

Filed Oct. 10, 1975, Ser. No. 621,412

Int. Cl.² B23P *19/04*

U.S. Cl. 29—237 **9 Claims**



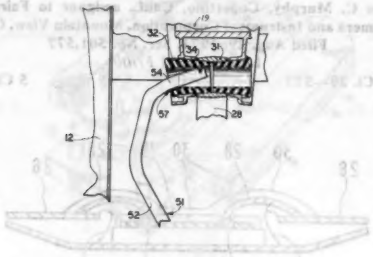
1. A pipe joint make up tool for securing two pipe members together at a joint, which comprises a split gripper collar assembled around the first pipe member and of a construction to provide an internal gripping surface in engagement with the first pipe member, said collar having rails along each facing edge which taper from a lesser height to a greater height in the direction towards the second pipe member, a wedge member disposed on opposite sides of the split gripper collar and having flanges on each side formed complementary to the rails on the split collar and received on said rails, power means connected to each wedge member, and a pulling member secured to each wedge member on opposite sides of the first pipe member and parallel to the axis of each pipe member to be joined and connected at the opposite end to the second pipe member, said power means being disposed to exert a selective balanced force on the wedge members and pull the latter along the rails on the collars to a greater wedging position thereby socketing the first pipe member and second pipe member together at the joint therebetween.

3,978,573

DEVICE FOR EXTRACTING BUSHINGS FROM A BUSHING SUPPORT

Martin D. Williams, 7904 4th St., Maud, Ohio 45069

Filed June 20, 1975, Ser. No. 588,856
Int. Cl.² B23P 19/02
U.S. Cl. 29—267 3 Claims



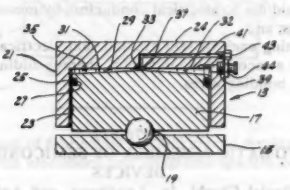
1. A device for removing a tubular bushing from a tubular bushing support which comprises a handle portion, and an operative head extending transversely of the handle portion and to one side thereof, the operative head being bar-like with a slot therein to form a hook projection adjacent an end of the operative head and facing away from the handle portion, the hook projection being engageable with the interior of the bushing while a portion of the operative head remote and on an opposed side of the operative head from the hook projection acts as a fulcrum so that the tool can be swung to cause the hook projection to free the bushing from the bushing support.

3,978,574

METHOD OF POSITIONING AND SUPPORTING A MACHINE

Morris Randall Stith, Jr., R.R. No. 1, Box 13, Webster, Ky. 40176

Filed Aug. 26, 1975, Ser. No. 607,921
Int. Cl.² B23Q 17/00
U.S. Cl. 29—407 11 Claims



1. The method of positioning and supporting an object, such as a large machine or other structure, on a foundation comprising the steps of:

placing a plurality of hydraulic jack units between the foundation and the object;

introducing a liquid under pressure into each of said jacking units to move the object relative to the foundation to a selected position, said liquid constituting a hydraulic working fluid and being hardenable to form a solid substantially without expanding or contracting as it hardens;

maintaining said liquid in each of said jacking units under pressure so as to support said object in its selected position; and

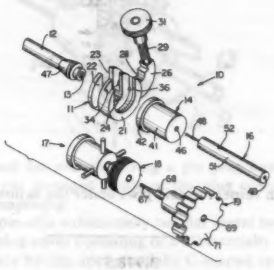
effecting the hardening of said liquid maintained in each of said jacking units to fix said jacking units in their respective positions with the object supported in its selected position.

3,978,575

METHOD AND DEVICE FOR EXTRACTING FILTER FRITS FROM LIQUID CHROMATOGRAPHIC COLUMNS

William F. Beyer, Portage, and Harry S. Dankert, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed June 18, 1975, Ser. No. 587,827
Int. Cl.² B23P 19/02
U.S. Cl. 29—427 7 Claims



1. A method of removing a nonthreaded pluglike filter from the end of a tube, comprising the steps of:

forming a small bore of preselected depth in said filter so that said bore is coaxially aligned with said filter and opens outwardly through one end thereof;

positioning a guiding member on the end of said tube so that an opening in said guiding member is aligned with said filter;

axially securing said guiding member relative to said tube;

rotatably threading a threaded extractor member into the opening formed in said guide member so that a central opening formed in said extractor member is aligned with the bore formed in said filter;

inserting a thread-forming tap through said central opening until the end thereof is adjacent the bore in said filter;

then rotating said tap for causing same to be threadably engaged with said filter and for causing said tap to move axially inwardly relative to said central opening until said tap substantially abuts said extractor member; and then

rotating said extractor member in a reverse direction relative to said guide member for threadably disengaging said extractor member from said guiding member while said extractor member simultaneously imposes an axial pushing force on said tap for pulling the filter from said tube.

3,978,576

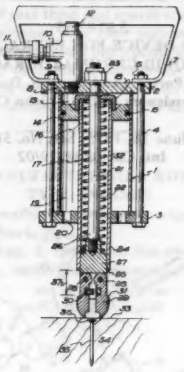
NAIL EXTRACTOR

Jack Mustoe, Jr., Cumbernauld, Scotland, assignor to Glentore Timber Products Limited, Cumbernauld, Scotland

Filed Apr. 21, 1975, Ser. No. 569,668
Claims priority, application United Kingdom, Aug. 9, 1974, 35378/74
Int. Cl.² B66F 15/00
U.S. Cl. 254—18 17 Claims

1. An extractor for nails comprising a cylinder, an end plate at each end of said cylinder, piston means reciprocable in said cylinder under the influence of fluid pressure, a center shaft disposed coaxially with a longitudinal axis of said cylinder and secured at one end to one of said plates, said shaft passing through the other one of said end plates, and a pair of gripping jaws located at the other end of said shaft, at least one of said jaws being movable between nail gripping and non-gripping

positions as a result of mechanical interaction between said piston means and said movable jaws upon displacement of said



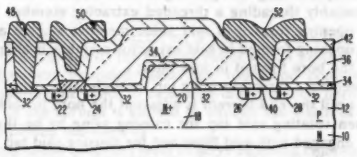
piston with respect to said jaws under the action of fluid pressure.

3,978,577

FIXED AND VARIABLE THRESHOLD N-CHANNEL MNOSFET INTEGRATION TECHNIQUE

Arup Bhattacharyya; Madhukar Laxman Joshi, both of Essex Junction; Charles Thomas Kroll, Essex Center, and Ronald Silverman, Essex, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1975, Ser. No. 591,595
Int. Cl.² B01J 17/00
U.S. Cl. 29—571 4 Claims



1. The method of making fixed and variable threshold field effect transistors comprising the steps of:

providing a plurality of paired source and drain regions and at least one isolation region of n-type semiconductor material in a semiconductor material of p-type conductivity,

providing a field dielectric structure over said source, drain and isolation regions comprising successive layers of silicon dioxide, aluminum oxide and silicon dioxide;

selectively removing said field dielectric structure from the channel regions of a plurality of source and drain regions associated with fixed threshold transistors;

growing a layer of silicon dioxide having a thickness of about 450 to 525 angstrom units in said channel regions of said fixed threshold transistors;

selectively removing said field dielectric from the channel regions of a plurality of sorce and drain regions associated with variable threshold transistors;

growing a layer of silicon dioxide having a thickness of about 31–34 angstrom units in said channel regions of said variable threshold transistors;

depositing a layer of silicon nitride over said field dielectric structure and said silicon dioxide layers in said channel regions;

depositing a layer of silicon dioxide over said silicon nitride layer; and

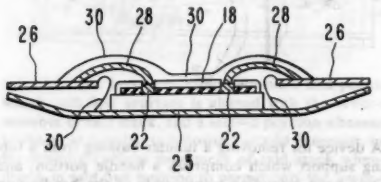
depositing conductive metallurgy to interconnect said fixed and variable threshold transistors.

3,978,578

METHOD FOR PACKAGING SEMICONDUCTOR DEVICES

James C. Murphy, Cupertino, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Aug. 29, 1974, Ser. No. 501,577
Int. Cl.² B01J 17/00
U.S. Cl. 29—577 5 Claims



1. A method for packaging semiconductor devices comprising the steps of:

a. spinning on a rotating platform a semiconductor wafer containing a multiplicity of integrated circuit die;

b. applying a polyimide material on said spinning wafer thereby providing a film of said polyimide material on the surface of each of said die;

c. hardening said polyimide film by heating said wafer at a first elevated temperature in a nitrogen atmosphere and then at a second higher elevated temperature in a nitrogen atmosphere;

d. etching selected areas of said polyimide film from the surface of said wafer, thereby exposing electrical circuit contact areas on each of said die;

e. separating said multiplicity of integrated circuit die from said wafer;

f. attaching each of said multiplicity of die to a support means;

g. electrically coupling said current contact areas on each of said die to electrical conductors by means of bonding wires; and,

h. coating each of said die and said electrical conductors with a second polyimide film, thereby adding strength to said bonding wires.

3,978,579

AUTOMATIC ASSEMBLY OF SEMICONDUCTOR DEVICES

Angelo Daniel Checki, Jr., Lyndhurst, and Anton Griswold Frey, Basking Ridge, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 30, 1974, Ser. No. 501,965
Int. Cl.² B01J 17/00
U.S. Cl. 29—589 2 Claims

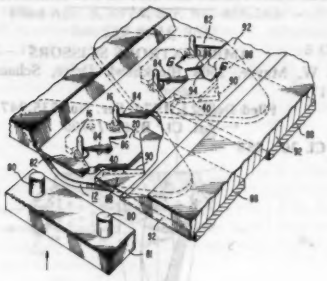
1. A method of assembling a mount assembly including a stem comprising a header member and at least two leads extending therethrough, and a semiconductor pellet mounted on said header, said method comprising:

accurately positioning the header of a stem at a first apparatus work station and engaging said leads by forming tools at said station for shaping said leads to dispose an end portion of each thereof in preselected positional relationship with said header,

thereafter disposing said header in loosely mounted disposition adjacent to a second apparatus work station and engaging said leads by positioning tools at said second

work station for accurately positioning both said leads and said header relative to said station,

disposing, at said station, an open-ended guide chute adjacent and leading to said header, and



disposing a semiconductor pellet within said chute and on said header, said chute providing accurate positioning of said pellet on said header.

3,978,580

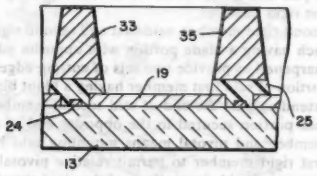
METHOD OF FABRICATING A LIQUID CRYSTAL DISPLAY

Alex M. Leupp, Newport Beach, and Hans G. Dill, Costa Mesa, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 374,444, June 28, 1973, Pat. No. 3,863,332. This application Sept. 27, 1974, Ser. No. 509,754

Int. Cl.² H01L *21/302*

U.S. Cl. 29—592 **3 Claims**



1. A method of fabricating a liquid crystal display having a backplate with electrodes and integrated spacers comprising the steps of:

a. forming an array of reflective electrodes in spaced apart columns and rows on a surface on a substrate,

b. forming a coating on said surface and over said electrodes by the steps which include,

i. depositing an insulating layer on said substrate surface and extending over said electrodes, and

ii. depositing a second layer over said first layer,

c. forming a lattice of said coating, comprised of spaced apart walls of uniform height extending at their bases over the edges of said electrodes, by removing those portions of said coating which overlie said electrodes out to, but not including, said edges, said lattice having a plurality of interstices aligned with said electrodes,

d. placing liquid crystal material into said interstices so as to cover said electrodes, and

e. securing a transparent front plate to said lattice, whereby said lattice maintains uniform spacing between said backplate and said front plate.

3,978,581

METHOD OF MAKING A PIN PLUG

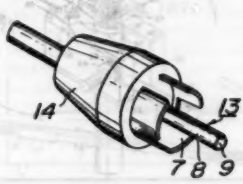
Yoshihiko Miura, Tokyo, Japan, assignor to Yuko Shindosho Company Limited, Tokyo, Japan

Division of Ser. No. 525,266, Nov. 19, 1974, abandoned. This application Feb. 12, 1975, Ser. No. 549,236

Claims priority, application Japan, Feb. 23, 1974, 49-22176[U]; Oct. 11, 1974, 49-116936; Apr. 4, 1974, 49-37894[U]; May 9, 1974, 49-52392[U]

Int. Cl.² H01R *9/00*

U.S. Cl. 29—630 A **4 Claims**



1. A method for manufacturing a pin plug having a plug cover and a pin arranged inside of the plug cover coaxially therewith, comprising:

forming a pin of a substantially tubular metal body;

forming a plug cover consisting of a substantially cylindrical metal body having a substantially C-shaped cross section which defines a slit which is wider than a diameter of the pin;

connecting two conductors of an electrical wire to the pin and plug cover, respectively, while the pin is positioned outside of the plug cover;

inserting the pin inside of the plug cover through the slit formed in the plug cover;

thereafter inserting the pin and plug cover into a mold member, the pin being disposed coaxially with the plug cover within the mold member; and

then injecting synthetic resin inside of the mold member so as to fix the pin and plug cover in position by means of the synthetic resin body thus molded.

3,978,582

CABLE INSULATION STRIPPING TOOL

Walter J. Maytham, Los Altos, Calif., assignor to Speed Systems, Inc., Los Altos, Calif.

Filed Feb. 18, 1975, Ser. No. 550,414

Int. Cl.² H02G *1/12*

U.S. Cl. 30—90.1 **5 Claims**

1. A tool for stripping insulation from an insulated conductor cable comprising:

body means;

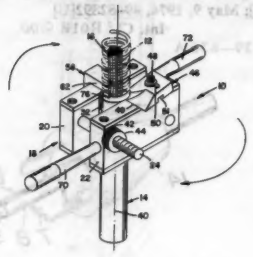
support means mounted to said body means to support a cable seated thereon;

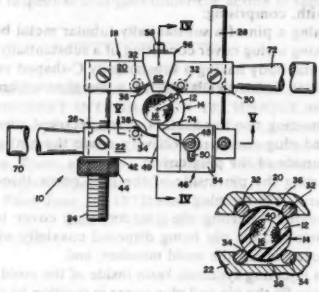
blade means mounted to said body means and having a cutting edge, the blade means being positioned so that upon relative turning of the body means and cable supported by the support means, about the longitudinal axis of the supported cable, (i) the cutting edge cuts the insulation thereof and (ii) the supported cable and body means are urged by the blade means to relatively move a distance generally along the longitudinal axis of the supported cable for each turn of the body means and cable relatively; and

movement control means for limiting relative movement of the supported cable and body means generally along the longitudinal axis of the supported cable for each turn of the body means and cable relatively, to a certain distance less than the distance the supported cable and body means would relatively be moved generally along the longitudinal axis of the cable so supported under urging of the blade means, whereby the movement control means determine the axial thickness of insulation re-

moved from the supported cable at each turn of the body means and cable relatively;

wherein the support means comprise support roller means comprising a plurality of rollers rotatably mounted to the body means, the axis of rotation of each roller being substantially parallel to one another and to the longitudinal axis of a cable to be supported thereby such that said rollers are positioned generally about a cable seated on the roller means, so that a cable seated on the plurality of rollers is generally surrounded by the rollers and supported thereby, the rollers rolling upon relative turning of the body means and cable.





3,978,583

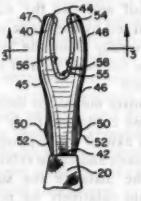
PEELING UTENSIL

William A. Papalardo, 63 Little Neck Road, Centerport, N.Y. 11721

Continuation-in-part of Ser. No. 441,132, Feb. 11, 1974, Pat. No. 3,885,307. This application Apr. 7, 1975, Ser. No. 565,832

Int. Cl.[2] A47J *17/02*

U.S. Cl. 30—123.5 **14 Claims**



1. A peeling utensil comprising an elongated handle and an elongated blade having a substantially convex bottom surface attached at one end thereof to said handle, said blade having an open ended slot extending for a distance from the other end of said blade, at least one side edge of said slot concave at least in part over its length, and said slot edges are sharpened downwardly and inwardly to form cutting edges on said convex bottom surface of said blade.

3,978,584

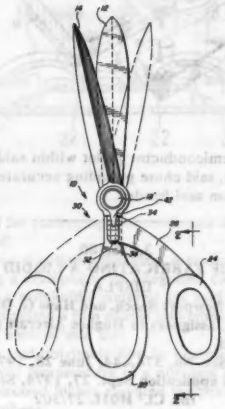
AMBIDEXTROUS SCISSORS

John W. Mayer, 1508 Blackhawk Drive, Schaumberg, Ill. 60172

Filed Dec. 23, 1974, Ser. No. 535,947

Int. Cl.[2] B26B *13/00*

U.S. Cl. 30—256 **5 Claims**



1. A pair of ambidextrous scissors, comprising:

a first rigid member;

a second rigid member, said first and second rigid members each having a blade portion with opposite edges thereof sharpened to provide two sets of cutting edges, the blade portion of said first member having a blunt blade end and extending past the end of said second member;

a base portion secured to the opposite end of said second member and pivotal means mounting said base to said first rigid member to permit relative pivotal movement between the blade portions of the rigid members;

a finger handle portion on said first rigid member having an eye sized to accommodate at least two fingers of the user;

a movable handle portion having a smaller eye for accommodating the thumb of the user;

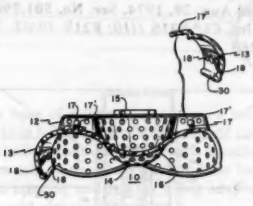
hinge means mounting said movable handle portion to said base for pivotal movement about the longitudinal axis of said second member between a first position for use by one hand of the user and a second position for use by the other hand of the user, said hinge means preventing longitudinal movement of said movable handle with respect to said second member;

selectively operable locking means for maintaining the movable handle in either its first or second position, said selectively operable locking means including a plunger mounted in said movable handle portion for alignment with a pair of bores in said base, said bores being spaced from said hinge means by a distance equivalent to the diameter of the bore and on opposite sides of said hinge means so that the plunger will engage one or the other of said bores when in its respective positions; and

a chamfered edge on both sides of the eye of said finger handle and the eye of said movable handle to facilitate the use of the scissors with one hand when in the first

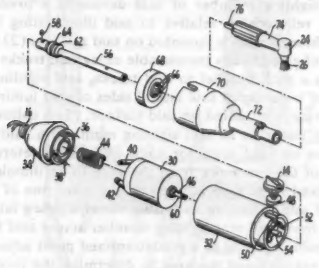
position and with the other hand when in the second position.

3,978,585
IMPRESSION TRAYS
Burton V. Holcomb, 138 E. 13th St., Burley, Idaho 83318
Filed Apr. 5, 1974, Ser. No. 458,263
Int. Cl.[2] A61C *9/00*
U.S. Cl. 32—17 5 Claims



1. An upper impression tray comprising a body which is a convoluted member having an oral plate which follows the general contours of the roof of the mouth and which provides a lingual portion adjacent the upper teeth, and buccal walls which are detachably mounted by snap lock elements to the outer rectilinear edges of the body, to form a depression in which impression compound may be disposed.

3,978,586
DENTAL APPARATUS
Roger F. Etherington, Newport Beach, Calif., assignor to The Denticator Company, Inc., San Francisco, Calif.
Filed Feb. 10, 1975, Ser. No. 548,478
Int. Cl.[2] A61C *3/06*
U.S. Cl. 32—27 9 Claims



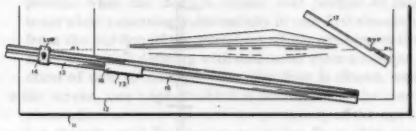
1. In a dental device comprising a casing for an electric motor, a tubular shank extending from the casing, a dental tool at the free end of the shank, and a drive shaft projecting through the shank for driving the dental tool with the electric motor, the improvement comprising a radially self-adjusting bearing circumscribing the drive shaft proximate the electric motor to minimize the imposition of side loads on the motor due to pressure exerted on the dental tool, said bearing comprising:

a first outer race member having a plurality of transverse projections spaced circumferentially about the drive shaft;

a plurality of balls located in the spaces between the respective projections in contact with the drive shaft, said projections preventing unrestricted radially inward movement of said balls; and

a second outer race member having a plurality of bias means disposed over the respective balls to bias said balls radially inwardly and permit limited movement of said balls radially outwardly, said second outer race member further including means for confining the balls between the second outer race member and the first outer race member to limit transverse movement thereof.

3,978,587
DRAFTING SYSTEM AND APPARATUS
Hilton Baugh, 8575 Glen Ellen Drive, Arvada, Colo. 80002
Filed Oct. 29, 1974, Ser. No. 518,256
Int. Cl.[2] B43L *13/14*
U.S. Cl. 33—77 13 Claims



1. A ruling blade for drawing perspective views and the like comprising:

a thin, flat, elongated body having a pair of oppositely disposed supporting flat side faces arranged parallel to one another and reversible with either side face up, a pair of oppositely disposed parallel ruling edges, a pair of oppositely disposed parallel end edges, a channel-shaped center groove in each of said side faces extending the full length thereof providing a pair of opposed inside flat wall surfaces parallel to one another, one of said side faces having a beveled surface terminating at a ruling edge, the other of said side faces having a lateral recess extending laterally inwardly from each of said ruling edges, the lateral recess adjacent the beveled edge having less depth than the lateral recess adjacent the ruling edge opposite the beveled edge.

3,978,588
MAGNETIC WIRE LINE MARKING, ERASING AND DETECTING METHOD AND APPARATUS
Robert L. Richardson, 536 E. Thompson Blvd., Ventura, Calif. 93001, and Norris Johnston, 4222 Thacher Road, Ojai, Calif. 93023
Continuation of Ser. No. 159,507, July 2, 1971, which is a continuation-in-part of Ser. No. 2,184, Jan. 12, 1970, abandoned. This application Aug. 6, 1973, Ser. No. 385,671
Int. Cl.[2] G08B *21/00*; G01R *1/16*
U.S. Cl. 33—126.5 1 Claim

1. A method of relocating equipment at a previously visited point in a well, the equipment being run on a magnetizable wire line, including the steps of:

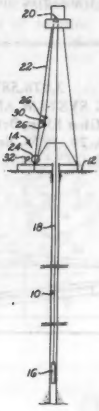
locating the equipment on the wire line at a desired point in the well;

while the equipment is at the desired point, applying three magnetic dipoles of alternating polarity in a closely spaced line to the wire line at an appropriate spot at the surface of the well, the three magnetic dipoles defining a center one of the dipoles as a guarded magnetic mark;

moving the equipment on the wire line from and then back

to the desired point; and

sensing the guarded magnetic mark at the same approximate spot at the surface thereby indicating the arrival of the equipment at the desired point.



3,978,589

APPARATUS FOR MEASURING TWO DIMENSIONS OF AN OBJECT AND COMBINING THE MEASURED VALUES TO OBTAIN SINGLE VALUE

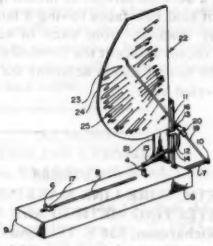
Lawrence Alvin Courtepatte, 14607 - 86 St., Edmonton, Alberta, Canada (P5E 3C6), and Kenneth Wilbur Currie, 16716 - 81 Ave., Edmonton, Alberta, Canada (T5R 3P7)

Filed Apr. 7, 1975, Ser. No. 565,566

Claims priority, application Canada, Nov. 28, 1974, 214805

Int. Cl.[2] G01B *5/08, 5/02*

U.S. Cl. 33—143 R **9 Claims**



1. Apparatus for measuring two dimensions of an object and combining the measured values to obtain a single value, comprising:

means establishing a fixed reference point,

first means movable with respect to the fixed reference point and adapted to measure one dimension of the object,

second means movable with respect to the fixed reference point and adapted to measure a second dimension of the object,

a fixed reference frame,

a single indicator associated with said first and second movable means, said indicator being movable relative to said reference frame, and

motion transmitting means physically connecting both said first movable means and said second movable means to said single indicator for positioning said indicator with respect to the fixed reference frame in dependence upon the positions of both said first and second movable means.

3,978,590

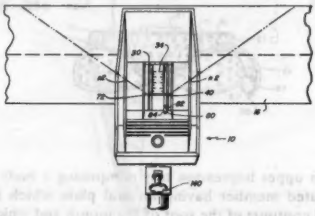
SIGHTING DEVICE FOR LUMINAIRE POSITIONING

William Ray Wedding, Southaven, Miss., and John David Kiss, Memphis, Tenn., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 29, 1974, Ser. No. 501,794

Int. Cl.[2] F21S *1/10;* **F21V** *19/02*

U.S. Cl. 33—263 **5 Claims**



2. A sighting device removably mountable on a luminaire adapted to illuminate an area spaced a distance from the luminaire, said luminaire including an illuminating face for projecting a beam of light therefrom directed toward the area to be illuminated, lateral sides of the luminaire bounding said face, and a housing surface enclosing the luminaire on the side remote from said face, said device including means mounting said luminaire at a fixed location at one of a predetermined distances from the area to be illuminated, means for adjusting the inclination of said luminaire on said mounting means to incline the beam and illuminate the area, said sighting device including (1) parallel spaced-apart stationary tracks disposing a rear sighting member of said device in a predetermined angular relationship relative to said illuminating face when said sighting device is mounted on said surface, (2) said sighting member manually translatable along said tracks for movement in a path parallel to said tracks, said sighting member disposed inwardly of said lateral sides of said luminaire when said device is mounted on said surface, (3) a calibrated scale defining positions of said sighting member in said path with positions on said scale for each of said predetermined distances of the luminaire from the area to be illuminated, and (4) a fixed front sighting member adjacent one of the lateral sides of said luminaire to enable visual sighting laterally outwardly from said rear sighting member across said front sighting member relative to a predetermined point adjacent to the lateral extremity of the area to determine the proper adjustment of the luminaire for projection of the beam to the area.

3,978,591

COMPASS, IN PARTICULAR FOR SKI AND COMPETITION TRACK FINDING

Erkki Kalle Jaaskelainen, Haukilahti, Finland

Filed Oct. 7, 1974, Ser. No. 512,927

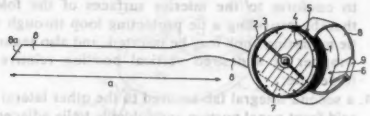
Claims priority, application Finland, Nov. 6, 1973, 3425/73

Int. Cl.[2] G01C *17/02;* **A45F** *5/00*

U.S. Cl. 33—334 **3 Claims**

1. In combination with a compass having a compass needle box containing a compass needle, compass graduations and a base plate with an opening, a device adapting the compass for use in cross-country track finding and in track finding on skis, said device being adapted to affix the compass to the wrist of a user having a hand and a thumb notch, the device being affixable upon the upper edge of the hand adjacent to the thumb notch and comprising an elongated strap, affixed at one end to said base plate and having a free other end, said strap

passing complementary slidably through said opening said opening being arranged in said base plate so that as said strap extends therethrough it is held at an angle with respect to said one end so as to define a thumb loop of adjustable size constituting a part of said strap lying between said one end of said strap and said opening, said thumb loop being adapted to



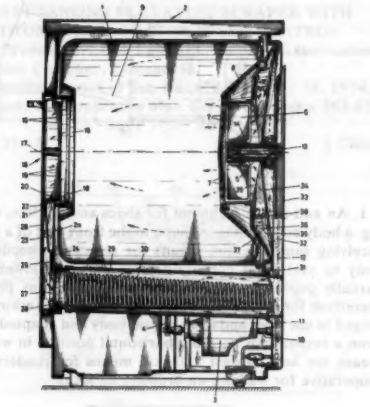
encircle the base of a thumb; and closure means disposed in said thumb loop for affixing said free end of said strap thereto, said strap passing when the compass is attached to the hand, starting from said one end, once around the base of the thumb through said opening and further being adapted to go around the wrist to said closure means.

3,978,592

DRYER IN PARTICULAR FOR LAUNDRY

Fredrik A. Schuurink, 27, Fr. Rooseveltlaan, Breda, Netherlands

Filed Aug. 28, 1974, Ser. No. 501,233
Claims priority, application Netherlands, Sept. 3, 1973, 7312132
Int. Cl.² F26B 21/06
U.S. Cl. 34—82 4 Claims



1. A dryer such as for laundry in which at least a portion of the air is recirculated, said dryer comprising:

a housing;

a rotatable drum in said housing, one end wall of said drum having an opening defined therein for access thereto and discharge of air therefrom;

said housing comprising an end plate having an opening therein of a size and location corresponding substantially to that of the drum opening and a plate portion which extends in a first direction from the periphery of the housing opening;

an openable and closable door mounted on said housing, said door comprising:

an outer plate spaced outwardly in a second direction perpendicular to said plate portion from said plate portion to define an air passage therebetween when the door is closed,

a perforated plate having at least a portion spaced inwardly in a direction opposite to said second direction from said outer plate a distance at least as great as the distance between the outer plate and the plate portion when the door is closed, said portion of said perforated plate being coextensive with the drum opening and lying substantially in the plane thereof when the door is closed.

an inner plate having means defining an opening therein of a cross-section greater than that of the drum opening, at least a portion of the periphery of the opening in the inner plate being spaced in said first direction from the periphery of the portion of the perforated plate to define a space therebetween, said inner plate having a portion substantially coplanar with said plate portion when the door is closed, said portion of said inner plate extending substantially in said first direction from the portion of the periphery of the opening in the inner plate and defining with said outer plate a continuation of said air passage when the door is closed, and

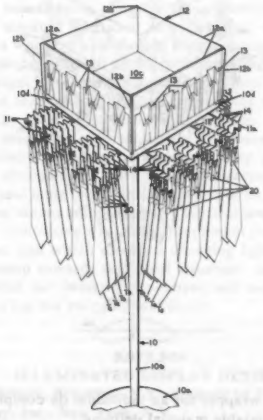
a lint screen, one edge of which is connected to the inner plate adjacent the portion of the periphery of the opening therein, said lint screen extending from that connection toward the perforated plate and the outer plate whereby when the door is closed said lint screen extends across the air passage to trap lint moving with the air through the perforated plate, the air passage and said continuation thereof and when the door is open said lint screen can be easily cleaned since it lies in the then open space between the portion of the periphery of the opening in the inner plate and the perforated plate.

3,978,593

DISPLAY AND MERCHANDIZING DEVICE FOR TIES

Sidney C. Pulitzer, New Orleans, and Aubrey L. Gouner, Metairie, both of La., assignors to Wembley Industries, Inc., New Orleans, La.

Filed Jan. 15, 1975, Ser. No. 541,185
Int. Cl.² B65D 73/00
U.S. Cl. 35—56 3 Claims



1. A merchandizing display for men's ties including a vertical panel having a plurality of true color images of popular colors of shirts respectively printed on said panel in a horizontal array, a tie support rod disposed beneath each said image, and means for supporting a plurality of medially folded ties on said rod in depending relationship thereto and with the plane of each tie parallel with the plane of said panel, each said tie being color co-ordinated with the said colored shirt image and

having a wrapper on the top portion thereof, each said wrapper having printed on the front face thereof a color replica of said colored shirt image; a front panel portion dimensioned to overlie and conform to the top portion of the tie when folded about its longitudinal center, said front panel portion bearing said replica of said colored shirt image; a tie-shaped aperture extending between and below the opposed collar edges of said printed shirt replica, whereby the pattern of the tie is displayed as a miniature tie in proper position with respect to said replica of said colored shirt image; a first integral tab secured to one lateral edge of said front panel portion and foldable to lie between the two folded portions of the tie, said tab having a tapering longitudinal extension of lesser width than the adjacent portions of the tie, said extension projecting substantially beyond the longitudinal center of the tie, and being reversely folded at a fold line to conform to the interior surfaces of the folded tie, thereby securing said wrapper in a desired vertical position relative to the folded tie; a second integral tab secured to the other lateral edge of said front panel portion and foldable to lie adjacent to the back surface of the folded tie; a medial portion of said first tab being cut to overlap both of said folded tie portions and lie contiguous with said second tab portion; means for detachably securing said medial portion of said first tab to said second tab; and a tie supporting hook hanging on said tie support rod and having means underlying and contacting said wrapper at said fold line, whereby said wrapper is vertically positioned with respect to said tie supporting hook.

3,978,594

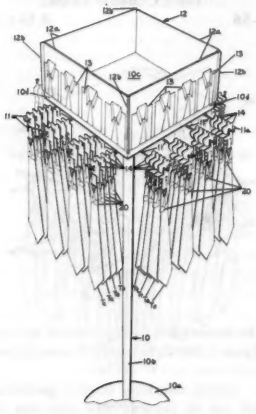
DISPLAY AND MERCHANDIZING DEVICE FOR TIES

Sidney C. Pulitzer, New Orleans, and Aubrey L. Gouner, Metairie, both of La., assignors to Wembley Industries, Inc., New Orleans, La.

Division of Ser. No. 541,185, Jan. 15, 1975. This application Nov. 26, 1975, Ser. No. 635,554

Int. Cl.² B65D *85/18*

U.S. Cl. 35—56 **7 Claims**



1. A display wrapper for an individual tie comprising a die cut sheet of printable material defining:

1. a front panel portion dimensioned to overlie and conform to the top portion of the tie when folded about its longitudinal center, said front panel portion having printed thereon a colored replica of the front collar portion of a colored shirt;
2. a tie-shaped aperture extending between and below the opposed collar edges of said printed shirt replica, whereby the pattern of the tie is displayed as a miniature tie in proper position with respect to said printed shirt replica;
3. a first integral tab secured to one lateral edge of said front panel portion and foldable to lie between the two folded portions of the tie, said tab having a tapering longitudinal extension of lesser width than the adjacent portions of the tie, said extension projecting substantially beyond the longitudinal center of the tie, and being reversely folded to conform to the interior surfaces of the folded tie, thereby providing a tie protecting loop through which a tie mounting hook may be inserted, and also securing said wrapper in a desired vertical position relative to the folded tie;
4. a second integral tab secured to the other lateral edge of said front panel portion and foldable to lie adjacent to the back surface of the folded tie;
5. a medial portion of said first tab being cut to overlap both of said folded tie portions and lie contiguous with said second tab portion; and
6. means for detachably securing said medial portion of said first tab to said second tab.

3,978,595

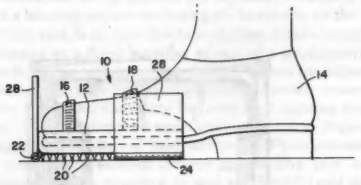
ANTI-SKID ATTACHMENT FOR SHOES

Pauline Carlisle Clark, Westbury, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Aug. 4, 1975, Ser. No. 601,812

Int. Cl.² A43B *3/18*

U.S. Cl. 36—7.7 **4 Claims**



1. An anti-skid attachment for shoes and the like, comprising: a body conforming in shape to the front part of a shoe and receiving same therein; means for removably securing said body to said front part, said body having a lower surface partially provided with rows of anti-skid means protruding therefrom for gripping slippery surfaces; and masking means hinged to the sides and front of said body and adapted to swing from a vertical position to a horizontal position in which said means are held against anti-skid means for rendering same inoperative for walking on ordinary surfaces.

3,978,596

SANDALS AND METHOD OF MAKING SAME

Dwight C. Brown, and Kevin B. Brown, both of 711 1/2 E. Houston, Pasadena, Tex. 77502

Continuation-in-part of Ser. No. 526,466, Nov. 25, 1974, Pat. No. 3,928,927. This application Nov. 24, 1975, Ser. No. 634,407

Int. Cl.² A43B *3/12*; A43D *9/00*

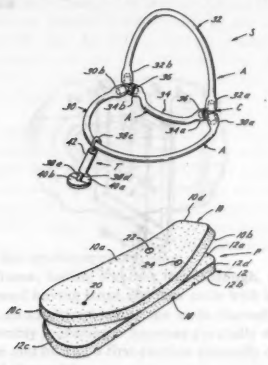
U.S. Cl. 36—11.5 **22 Claims**

1. A sandal adapted to be worn on the foot, comprising:

a laminated platform conforming substantially to the shape of the sole of the foot and including a toe end and a heel end, said laminated platform having an upper layer and a lower layer;

stirrup strap means mounted with said laminated platform for securing said platform to the foot, said stirrup strap means including:

instep strap means for extending over the instep of the foot;
heel strap means for extending around the heel of the foot; and,
arch strap means for extending beneath the arch of the foot;



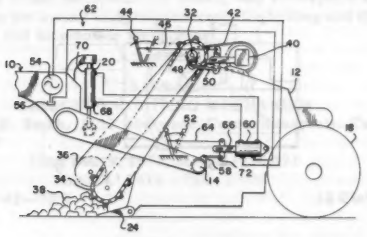
three pronged connector means for adjustably joining said arch strap means, instep strap means and said heel strap means together; and
toe securing means for connecting said toe end of said laminated platform with said instep strap means, said toe securing means adapted to be positioned between adjacent toes of the foot.

3,978,597

DRAFT SENSING ELEVATING SCRAPER WITH AUTOMATIC ELEVATOR SPEED CONTROL

Andrew Brudnak, Jr., Oak Lawn, Ill., assignor to International Harvester Company, Chicago, Ill.

Continuation-in-part of Ser. No. 470,706, May 16, 1974, abandoned. This application Mar. 27, 1975, Ser. No. 562,624
Int. Cl.² B60P *1/36*; A01B *41/06*
U.S. Cl. 37—8 **4 Claims**



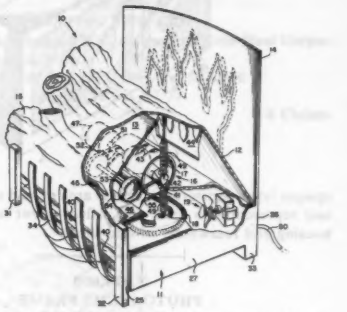
1. An elevator control system for a scraper having a tractor pivotally attached to a bowl, an engine and an elevator pivotally mounted on said bowl, said control system comprising, in combination:
variable speed drive means operably connected to said elevator and said engine for controlling the speed of said elevator;
motion sensing means responsive to said elevator's pivotal motion for varying the speed of said variable speed drive means;
a connector operably connecting said motion sensing means and said variable speed drive means;
speed selector means operably connected to said variable speed drive means for establishing the optimum speed of said elevator; and
a linkage arrangement operably connecting said variable speed drive means and said selector means.

3,978,598

APPARATUS FOR SIMULATING AN OPEN FIRE

Bernard R. Rose, 933 Airole Way, Bel Air, Calif. 90024; Daniel H. Meggs, 4313 Vista Largo, and Janos Beny, 4445 Pacific Coast Highway, both of Torrance, Calif. 90505

Filed Jan. 16, 1975, Ser. No. 541,605
Int. Cl.² G09F *13/36*
U.S. Cl. 40—106.52 **9 Claims**



1. Apparatus for simulating an open fire, comprising:
base structure having a front and rear edge;
a light projection screen mounted on said base structure to extend upwardly from its rear edge;
first mask means mounted on said base structure forwardly of said projection screen, said first mask means having a light transmitting portion therein which defines the image of a flame;
lens means between said first mask means and said screen;
shell structure mounted to extend from the front edge of said base structure, said shell structure being formed to simulate a pile of burning logs or the like and being at least in part light transmitting; and
lamp means mounted on said base structure forwardly of said first mask means within said shell structure, said lamp means being operable when illuminated to project light towards said shell structure and said first mask means whereby an enlarged image simulative of a flame is projected through said light transmitting portion of said first mask onto said projection screen and the light transmitted through said shell structure gives said shell structure the appearance of burning material;
second mask means mounted on said base structure and positioned to extend between said lamp means and said shell structure for controlling the transmission of light from said lamp means to said shell structure; and wherein:
said lamp means comprising an electrical lamp and said first mask comprising a rotating drum means positioned thereabout and which directs a changing light pattern from said lamp towards said shell structure, said lamp being mounted for swinging movement and motor means for producing the swinging movement.

3,978,599

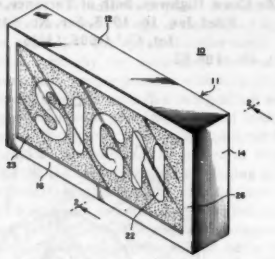
ILLUMINATED DISPLAY DEVICE

Barry D. Berger, Brooklyn, N.Y., assignor to Thomson-Leeds, Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 536,896, Dec. 27, 1974, abandoned. This application Nov. 12, 1975, Ser. No. 631,269
Int. Cl.² G09F *13/08*
U.S. Cl. 40—132 R **6 Claims**

1. An illuminated display device comprising a housing having a front opening, a light transmissive sheet supported by said housing and registering with said opening and having a rearwardly convex curved projecting representation area of hemispherical cross-sectional configuration formed thereon,

said curved representation area having a thickness less than the thickness of the rest of said sheet and possessing fluorescent properties for brightening the image, a substantially



opaque layer registering with the area of said sheet other than said representation area, and a fluorescent lamp within said housing and rearwardly of said sheet.

3,978,600

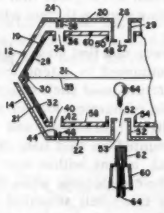
PHOTO-LIGHT FRAME

Seyd M. Rasoulinejad, New York, N.Y., assignor to Lawrence Peska Associates, Inc., New York and Thomas Cantone, Valley Stream, both of, N.Y., part interest to each

Filed Sept. 8, 1975, Ser. No. 611,559

Int. Cl.² G09F *13/00*

U.S. Cl. 40—152.2 **10 Claims**



1. An illuminated picture display device comprising a first substantially closed hollow body means having a plurality of face means for mounting picture elements thereon, lamp assembly means positioned within said first hollow body means, second transparent substantially closed hollow body means, the inner wall of said second hollow body nestable against the outer wall of said first hollow body, vent hole means in the surface of said second hollow body registerable with vent hole means in said first hollow body.

3,978,601

DISPLAY FRAME WITH RETRACTABLE GARMENT SUPPORT

H. Wayne Catron, Rte. 1, Independence, Va. 24348

Filed Dec. 22, 1975, Ser. No. 643,377

Int. Cl.² G09F *23/06*

U.S. Cl. 40—322 **8 Claims**

1. A display frame with retractable garment support comprising

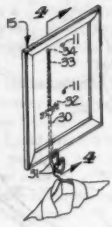
a. a mounting base adapted to be secured to a wall or like support,

b. a display frame removably supported on and covering said mounting base,

c. a garment hanging member supported for vertical movement between said mounting base and said display frame and including at least one garment hanging hook on the lower end thereof,

d. resilient means normally urging said garment hanging member upwardly to retracted position with said hook substantially hidden by said display frame, and

e. locking means operably associated with said garment hanging member for maintaining said hook in a lower



extended position below said display frame so that garments may be supported thereon, said hanging member being pivotal about a vertical axis whereby it is disposed parallel to siad mounting base in said retracted position and perpendicular to said mounting base in said lower extended position.

3,978,602

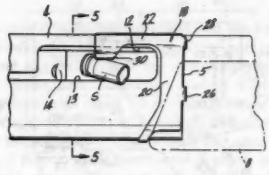
SHELL DEFLECTOR-CATCHER

Edward Lucas Morrow, Fairfield, and Peter Edward Colatosti, Hamden, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Oct. 14, 1975, Ser. No. 622,192

Int. Cl.² F41C *27/00*

U.S. Cl. 42—1 T **7 Claims**



1. A device adapted to be removably mounted on a receiver of a firearm to deflect or catch a spent shell casing ejected through an ejection port on the firearm, said device comprising:

a. a pair of legs extending substantially perpendicularly to each other and contoured to fit closely to the side of the firearm receiver;

b. hook means formed at one end of one of said legs for engagement with a side wall of a loading port on the firearm receiver;

c. tab means formed on one edge of said one of said legs and bent at substantially right angles to said one of said legs to engage a front wall of the receiver; and

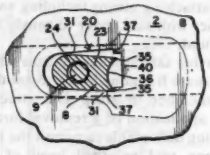
d. finger means formed at an end of the other of said legs and depending therefrom to a location outwardly offset from the ejection port to engage a spent shell ejected therefrom.

3,978,603

SAFETY FOR REVOLVERS

Frank Murabito, 64-24 80th Ave., Glendale, N.Y. 11227

Filed Apr. 28, 1975, Ser. No. 572,356
Int. Cl.[2] F41C 17/00, 1/00
U.S. Cl. 42—66 7 Claims



1. A safety for revolvers comprising:
a revolver frame, having a recess therethrough, said recess being formed having front and rear ends with at least one abutment catch intermediate the ends thereof;
a firing assembly including a hammer pivotally mounted in said frame and having a first portion pivotally operatively connected therewith;
a thumbpiece slidably disposed on the outside of said frame and projecting through said recess, said thumbpiece including an insert member slidably disposed in said recess and having at least one point substantially complementary to said at least one abutment catch for releasable engagement thereagainst;
a slide pin displaceably disposed in said frame and connected to said thumbpiece for joint displacement therewith yet mounted pivotally relative thereto;
said slide pin having a second portion adjacent to said first portion of said hammer, said slide pin being movably between an operative position and an inoperative position;
a cylinder disposed in said frame and operatively receiving said slide pin in an operative position of the latter for retaining said cylinder in said frame, in said inoperative position of said slide pin, the latter being removed from said cylinder, whereby said cylinder is released; and
spring means for operatively biasing said thumbpiece and slide pin toward said abutment catch for holding said slide pin and thumbpiece thereagainst.

3,978,604

TRIGGER INHIBITING MECHANISM

Joseph E. Smith, 1137 Sherwood Court, Sunnyvale, Calif. 94087

Filed Dec. 9, 1974, Ser. No. 530,891
Int. Cl.[2] F41C 17/02, 27/00
U.S. Cl. 42—70 E 12 Claims

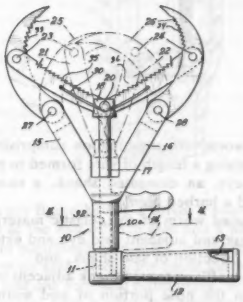
1. A safety device for preventing unauthorized firing of a weapon having a trigger and a handle comprising:
a nonferruginous housing for mounting about the handle of said weapon;
a magnetically attractable bar extending outwardly from said housing, pivotally mounted in said housing and balanced about the pivot;
stop means for preventing said bar from pivoting beyond a predetermined arc; and
magnetic means for maintaining said bar in a position subsequently in the center of said arc.

3,978,605

FLOATING FISH GRIP

Adam Maruniak, Otsego, Mich., assignor to Meto-Plast Corporation, Kalamazoo, Mich.

Filed May 30, 1975, Ser. No. 582,346
Int. Cl.[2] A01K 97/14
U.S. Cl. 43—5 4 Claims



1. A fish grip comprising a body member having at one end cheliform jaws adapted to encircle and grip a fish and at the other end a handle, means for holding the jaws in open position, and means for actuating the jaws to the closed or gripping position, said grip being characterized in that the parts are constructed of material having a specific gravity greater than one and the handle has an air compartment of sufficient size to reduce the over-all specific gravity to less than one; in that the jaws and the handle are made of rigid plastic which can be molded or machined, has a tensile strength of at least 5,000 psi, and has a specific gravity of about 1.1 to 1.2; in that the body member is Y-shaped, the cheliform jaws are pivotally attached to the arms of the Y-shaped body, and the handle is attached to the bottom of the stem of the Y-shaped body and projects laterally therefrom in the same plane as the jaws and forms a right angle with said stem; in that the means for actuating the jaws to the closed or gripping position, includes a fingergrip, which projects laterally from said Y-shaped body parallel to the handle without changing its parallel relation thereto, is spaced from the handle not more than a handgrip away, and has a spring-biased linkage to the cheliform jaws, which when the fingers apply pressure to the fingergrip, actuates the cheliform jaws against said spring bias to the closed or gripping position and continued pressure on the fingergrip, after a fish has been gripped, asserts a corresponding gripping pressure on the fish; in that the linkage comprises an axially movable member rigidly attached at one end to the fingergrip and pivotally attached at the other end to links which in turn are pivotally attached to the cheliform jaws at points intermediate their free ends and their pivoted ends; and, in that both the links and the cheliform jaws are seriated.

3,978,606

FISHHOOK AND WORM LURE COMBINATION

Royal W. Riggs, 2406 Albert Lea, Sedalia, Mo. 65301

Filed July 21, 1975, Ser. No. 597,563
Int. Cl.² A01K *85/00*
U.S. Cl. 43—42.24 **5 Claims**

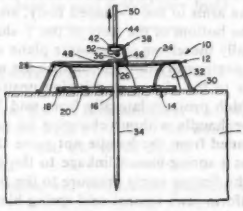
1. A fishhook and worm lure combination comprising:
a. a fishhook comprising a length of wire formed to present successively an eye, an elongated shank, a re-entrant curved bight, and a barbed point,
b. a slender, elongated worm of soft, elastic material disposed with its nose end adjacent said eye and extending therefrom in the direction of said shank, and
c. an anchor member affixed to said shank adjacent said eye and embedded in the nose portion of said worm, said anchor member comprising a length of wire having the form of a helical coil of larger internal diameter than said shank, afixed to said shank in coaxial relation thereto, whereby said worm may be impaled over the point of said hook, moved slidably along the bight and shank portions of said hook to said coil, and screwed into engagement with said coil by rotating it around said shank.

3,978,607

SNAIL SNARE

Felix V. Piere, 3602 Summer Shore Lane, Westlake Village, Calif. 91361

Filed May 22, 1975, Ser. No. 579,833
Int. Cl.² A01M *25/00*
U.S. Cl. 43—131 **6 Claims**



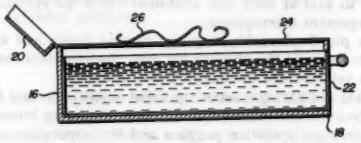
1. A snail snare adapted to be placed upon ground comprising:
a disc having a central aperture, said disc adapted to be placed in direct contact with the ground, said disc adapted to have placed thereon a quantity of pelletized poison material;
a cover having a base and an annular wall connected to the periphery of said base, said cover having a central opening, said cover to be positioned over said disc with said base spaced above said disc with said wall in direct contact with the ground, said wall having opening means therein to permit snails to move under said base and have access to the pelletized poison located on said disc;
attaching means extending through said aperture of said disc and said opening of said cover penetrating the ground, said attaching means including an enlarged head in tight contact with said cover to snugly hold said cover upon the ground;
means for removing said attaching means when it is desired to move said snare from one locale to another, said means including a member to grasp said attaching means to facilitate the application of a removal force, said base of said cover being deflectable to permit the insertion of said means between said enlarged head of said attaching means and said base.

3,978,608

METHOD OF EFFECTING A CONTINUOUS MOVEMENT OF A FIBROUS MATERIAL

Thomas Kovachevich, 4845 S. Kenwood Ave., Chicago, Ill. 60615

Filed Aug. 20, 1975, Ser. No. 606,069
Int. Cl.² A63H *33/00*
U.S. Cl. 46—1 R **12 Claims**



1. A method for effecting the continuous movement of a fibrous material comprising the steps of
providing an environment which includes a source of gaseous vapors,
providing a membrane permeable to said vapors and positioned relative to said vapors such that vapors emanating from said source make contact with and permeate said membrane,
and providing a body of vapor-responsive flexible sheet material freely positioned on the surface of said membrane and above said source of vapors,
whereby vapors emanating from the source thereof pass through said permeable membrane and coact with said fibrous material thereby causing a twisting, curling end-over-end, horizontal movement of said fibrous material body which is continuous with the provision of vapors through said membrane.

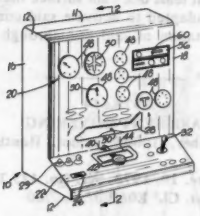
11. An article of manufacture comprising, in combination,
a container adapted to contain a quantity of vaporizable liquid,
a permeable membrane means adapted for supporting said membrane in position immediately above said container with a major surface of said membrane generally facing said container,
a quantity of a vaporizable liquid positioned within said container and immediately below said membrane,
and a body of fibrous vapor-responsive flexible sheet material adapted for free positioning on the upper surface of said membrane and above said liquid,
whereby vapors emanating from said liquid contact and permeate said membrane and coact with said fibrous material to cause movement of said fibrous material body which continues as long as said permeation continues to occur.

3,978,609

AIRPLANE GAME APPARATUS

Robert English, Hollywood, Fla., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed July 14, 1975, Ser. No. 595,668
Int. Cl.² A63H 27/04
U.S. Cl. 46—1 B 4 Claims



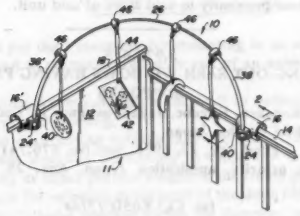
1. An airplane game, which comprises:
a. a housing having a base, a rear wall, a front wall, a pair of sidewalls, and a top, said front wall having a square aperture therethrough;
b. a control rod journalled for rotation through said front wall;
c. a model airplane mounted on a pin, said pin journalled for rotation through said front wall;
d. a connecting rod contained in said housing, said lever arm communicating between said control rod and said pin;
e. a throttle rod extending through a rectangularly shaped aperture;
f. a plurality of first pulleys mounted on said throttle rod within said housing;
g. a plurality of dials having indicia thereon, each said dial mounted on an axle rod journalled for rotation through said front wall;
h. a second pulley mounted on an inner end of each axle rod within said housing; and
i. a pulley belt communicating between each said first and second pulley.

3,978,610

MOBILE

Albert Stubbmann, Franklin Lakes, N.J., assignor to Kohner, Inc., New York, N.Y.

Filed Sept. 24, 1975, Ser. No. 616,358
Int. Cl.² A63H 33/00
U.S. Cl. 46—32 12 Claims



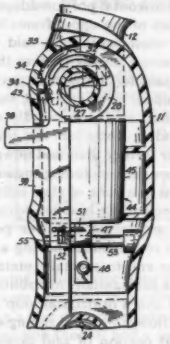
12. A pre-assembled mobile for slidable attachment to a crib, comprising:
a flexible arcuate rod;
means slidably mounted on said rod for suspending figures therefrom; and
elastic means for rotatably supporting said rod and for frictionally engaging said crib while being slidable thereon.

3,978,611

TOY FIGURE WITH PISTOL DRAW ACTION

Ned Strongin, Baldwin, N.Y., assignor to Ned Strongin Associates, Inc., New York, N.Y.

Filed May 14, 1975, Ser. No. 577,530
Int. Cl.² A63H 5/00
U.S. Cl. 46—118 6 Claims



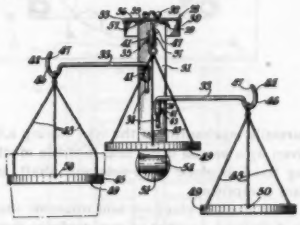
1. A toy figure having a torso, a head, a pair of arms with a hand at the end of each arm and a pair of legs comprising a holster positioned on one leg, means movably mounting one said arm on said torso, a toy pistol carried by the hand at the end of said one arm, said pistol being receivable in said holster and movable from a holstered position wherein said one arm is in a first position along the torso of the figure to a firing position wherein said one arm is in a second position extended outwardly of said torso, and means operating between said torso and said one arm for moving said pistol from said holstered position to said firing position, said operating means including pin means carried by said one arm eccentrically of the axis of rotation thereof and an operating element vertically slidable within said torso, said operating element including a control member extending outwardly of said torso for moving said element and means defining a generally concave camming surface for cooperative engagement with said pin means.

3,978,612

FLOWER POT HOLDER

Michael W. K. Young, Flushing, N.Y., assignor to Oriental Buying Service, Inc., Wilmington, Del.

Filed May 30, 1975, Ser. No. 582,212
Int. Cl.² A01G 9/02
U.S. Cl. 47—40 2 Claims



1. In combination with a window having a sash comprising a frame having an upper frame member containing a top

portion, an interior front frame portion, and an exterior back frame portion, a flower pot holder comprising:

a. a bracket comprising

1. an upper element adapted to rest upon said top frame portion having a downwardly extending exterior portion adapted to engage said exterior back frame portion, said downwardly extending exterior portion lying in a plane, said upper element further being arranged to mate in a slidable engagement with a horizontal portion of a normally vertical downwardly extending bracket portion,

2. a normally downwardly extending bracket portion having a top horizontal portion adapted to extend over said top portion of the upper frame member and to be in a slidable relationship with said upper element of said bracket screw means passing through said upper element and said top horizontal portion to selectively secure said upper element and said top horizontal portion together, said downwardly extending bracket portion extending down on the interior of said top frame member further than said downwardly extending exterior portion and including means at its lower end for attachment to a pane of glass held by said sash, said downwardly extending bracket portion having attachment means to receive a flower pot suspension rod member, said rod member having a normally vertical portion at one end to pivotally mate with said attachment means, a substantially horizontal portion intermediate its ends and a horizontal loop at its other end to encompass a flower pot, the sliding engagement of the top horizontal portion of said downwardly extending bracket portion and said upper element constituting adjusting means to enable mounting of said bracket on frames of varying thickness, the attachment means further having associated lock means to hold said rod member within a predetermined fixed position.

3,978,613

TURNSTILE MECHANISM

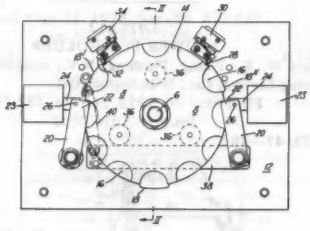
Martin Henry Hayward, Berkhamsted, and Michael Charles Newton, Stevenage, both of England, assignors to Automatic Revenue Controls (Europa) Ltd., Watford, England

Filed Apr. 25, 1975, Ser. No. 571,772

Claims priority, application United Kingdom, Apr. 29, 1974, 18811/74

Int. Cl.² E06B *11/08*

U.S. Cl. 49—46 **11 Claims**



1. A turnstile mechanism of the type having a hub adapted to be driven by a person using said turnstile mechanism, said hub being fixed in place on a rotatable shaft, said turnstile mechanism comprising

a stop plate fixed in place on said rotatable shaft, said stop plate defining a number of stop surfaces thereon,

a stop member positioned to engage the stop surfaces of said stop plate, said stop member being movable between a first position clear of the path of the stop surfaces and a second position lying in the path of the stop surfaces,

a control device connected to said stop member, said control device being operable to hold said stop member against a bias in one of the first and second positions, and said control device being activated to change the position of said stop member from the first position to the second position after said hub has been rotated through a predetermined angle, and

a cam plate fixed in place on said rotatable shaft, said cam plate defining at least one cam surface thereon, said cam surface being adapted to activate said control means in response to rotation of said hub through the predetermined angle.

3,978,614

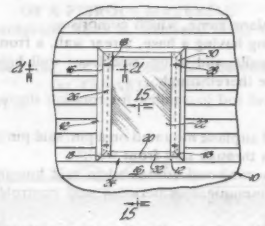
CASEMENT COVERING

Marvin L. Goldhaber, 10005 Talbot, Huntington Woods, Mich. 48070

Filed Dec. 10, 1973, Ser. No. 423,273

Int. Cl.² E06B *3/30, 7/00*

U.S. Cl. 49—55 **4 Claims**



1. A protective window unit formed to fit in window casements of varying sizes on the outside face of a conventional window, said window unit comprising:

a peripheral member having an inner channel;

a transparent shielding material, the edges of which are mounted in said channel and enclosed by said peripheral member, said shielding material being of sufficient strength to prevent entry through said window;

first threaded fasteners extended through both said peripheral member and the edge portion of said shielding material to attach said window unit to said casement;

laterally displaceable side members positionable on the outer side faces of said peripheral member for enclosing any space between the sides of said unit and said casements; and

second threaded fasteners extending through said laterally displaceable side members securing same to said casement, said side members being so sized as to cover up the first memtioned threaded fasteners that are located on or in close proximity to said sides of said unit.

3,978,615

SLIDING-OUT SASH WINDOWS HAVING PIVOTAL SUPPORTS

Tetsuro Kagoura, Kurobe, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Apr. 23, 1975, Ser. No. 570,741

Claims priority, application Japan, Apr. 26, 1974, 49-48462[U]

Int. Cl.² E05D *15/44*

U.S. Cl. 49—251 **8 Claims**

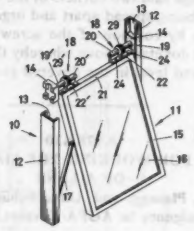
1. A window assembly comprising:

a. an outer frame having a pair of side posts with a pair of opposed elongated guideways therein, respectively;

b. a sash; and

c. means mounting said sash in said frame for swinging movements between open and closed positions, said means including:

1. a pair of slides slidable in said guideways;
2. two pairs of axially aligned longitudinally spaced sleeves secured to said sash at opposite sides thereof adjacent said guideways;
3. two pivot pins respectively secured to said slides and each slidably projecting into one of said sleeves;
4. a pair of annular adjustor rings rotatably disposed in the spacing between said sleeves of each said pair of sleeves;



5. a pair of helical compression springs extending through said adjustor rings and into the adjacent ones of said sleeves urging said pivot pins toward said slides, respectively; and
6. a pair of keys respectively carried by said adjustor rings and projecting into the space between adjacent turns of the adjacent one of said springs;

whereby the compression with which the slides engage the guideways can be adjusted by rotation of the annular adjustor rings.

3,978,616

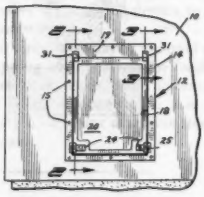
PET DOOR

Everett C. Pennock, Minneapolis, Minn., assignor to North States Industries, Inc., Minneapolis, Minn.

Filed June 4, 1975, Ser. No. 583,792

Int. Cl.² E05F *1/10*

U.S. Cl. 49—386 **4 Claims**



1. In a pet door assembly for mounting in an opening in a shelter wall to permit entrance or exit of an animal pet at its will,

a. a frame for mounting on the wall to define a doorway within said opening,

b. a flat door having substantially the same shape and size as said doorway positioned to close the doorway and having its upper portion hinged to the frame on a horizontal axis for swinging movement of the door from a normal vertical closed position within the doorway to open positions in either direction,

c. said door having an upwardly facing cam on the upper edge thereof, said cam having a dome shape in cross section perpendicular to the plane of the door and having rounded cam surfaces connected by a flat central portion which is parallel to the upper edge of the door,

d. a slide member mounted on the upper portion of the frame for vertical sliding movement and having a flat bottom face in flush engagement with the flat central portion of the cam, and

e. spring means disposed between the slide and the frame to yieldably retain said face and portion in such flush engagement.

3,978,617

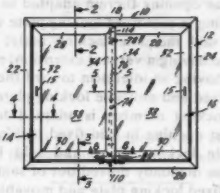
SELF-CLOSING REFRIGERATOR DOOR

Arnold T. Eventoff, 243 N. Ridge St., Port Chester, N.Y. 10573

Filed May 1, 1975, Ser. No. 573,752

Int. Cl.² E05D *15/06*

U.S. Cl. 49—404 **19 Claims**



1. In a self-closing refrigerator door assembly of the sliding type having a frame mounted in a refrigerator wall opening, said frame having a pair of parallel adjacent tracks depending from the upper portion thereof and a pair of parallel adjacent tracks protruding from the lower portion thereof, inner and outer doors each having a channel in the upper portion thereof mateable with said depending tracks and each being supported on rollers, each of said doors being mounted on one of said pair of upper and lower tracks for translatory movement in said frame, a closing system for each door consisting of an energy producing closing means the biasing action of which is activated upon opening of said door, cable means attached to an end of said closing means, means for guiding said cable means to the underside of said door for engagement with the lower portion of said frame to thereby activate the biasing action of said energy producing closing means, the improvement comprising a latching means attached to the end of said cable means at the underside of said door and a catch secured to the lower portion of said frame engaged with said latching means when said door is in the open position and disengaged from said latching means when said door is in the closed position.

3,978,618

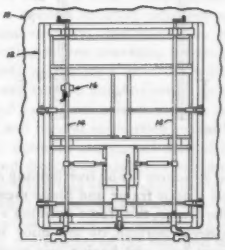
BOX CAR ANTI-PILFERAGE DEVICE FOR PLUG DOORS

Lowell L. Malo, St. Peters, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed May 10, 1974, Ser. No. 468,855

Int. Cl.² E05D *15/10*

U.S. Cl. 49—449 **12 Claims**



1. A box car plug door anti-pilferage device comprising:

a fixed locking plate mounted upon the plug door and having a locking portion extending outwardly from said door toward the operating arm of a plug door; tripping means also mounted on said plug door and being vertically spaced from said locking portion, said fixed locking plate having a first opening adapted to receive an additional locking device and a second opening adapted to receive a locking pin; a movable locking plate mounted upon said plug door operating arm also having a first opening adapted to align with the first opening in said fixed locking plate and adapted to receive a portion of said additional locking device, and having a second opening adapted to align with the second opening in said fixed plate and adapted to receive a locking pin; a locking retainer plate mounted upon said plug door operating arm having an opening therein adapted to align with the second opening in said fixed locking plate and the second opening in said movable locking plate; said movable retainer plate having a vertical extension; means urging a locking pin having an idler arm toward the second opening in said fixed and movable locking plate whereby said additional locking member is adapted to be removed from the first opening in said fixed locking plate and in said movable locking plate, and said locking pin is adapted to be manually moved out of said second openings in said fixed locking plate and movable locking plate and held out of engagement by engagement of the locking pin idler arm with the vertical extension on said retainer plate, and whereby said tripping member is adapted to disengage said locking pin idler arm from said retainer extension and permit said locking pin to ride upon a surface of said fixed locking plate and whereby when said plug door is rotated into the closed position said second openings in said fixed and movable plates will align and said locking pin will automatically move into said second openings and said first openings in said fixed and movable plates will align and be adapted to receive a padlock, seal or cable.

3,978,619

DOOR FRAME FOR AN OVERLAPPING DOOR

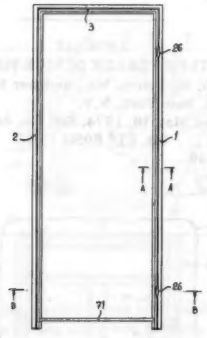
Jean-Claude Gregoire, 24 Saint-Martial D'Artenset, France

Filed Mar. 19, 1974, Ser. No. 452,665

Claims priority, application France, Mar. 20, 1973, 73.09905

Int. Cl.² E06B *1/04*

U.S. Cl. 49—504 **11 Claims**



1. A door frame structure for an overlapping door, comprising in combination a door frame and hinge means for mounting the door on the frame, the frame defining a front face for receiving a peripheral portion of the door in overlapping relation to the front face and having two posts defining between the posts a door passage, each post having a vertical groove which is open toward the door passage, one of the grooves being a keeper for latch means of the door, at least one of the posts having a vertical groove of dovetail cross-sectional shape defining two corners in cross-section and provided in a part of said front face corresponding to said one of the posts, said hinge means comprising a fixed hinge part, an extension in fixed relation to the hinge part and slidably engaged in the dovetail groove and having a shape complementary thereto and a screw screwthreadedly engaged in the extension the assembly consisting of the extension and screw defining a structure which has in said cross-section two corners which engage said two corners of the dovetail groove and are capable of being spread apart and urged into the dovetail groove corners by rotation of the screw for tightening the assembly in the dovetail groove whereby the extension is held fast at the desired level in the dovetail groove.

3,978,620

APPARATUS FOR WORKING THE MARGINAL ZONES OF A LENS

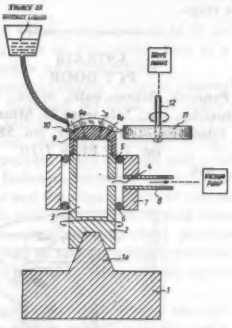
Paul Feneberg, Planegg, and Anton Schätz, Munich, both of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Division of Ser. No. 474,429, May 29, 1974, Pat. No. 3,948,007. This application June 13, 1975, Ser. No. 587,233

Claims priority, application Germany, May 30, 1973, 2327583

Int. Cl.² B24B *13/00, 9/14*

U.S. Cl. 51—105 LG **11 Claims**



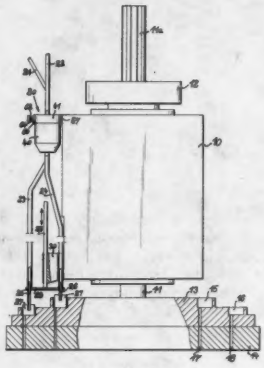
1. An apparatus for working marginal zones of a lens — particularly a contact lens — which is of soft and readily damaged material and has a curved side bounded by a circumferential marginal portion, comprising a rotatable support having a surface on which the lens is to be placed and which extends transversely through the axis of rotation of said support, said surface having a center portion curved matingly relative to said curved side of said lens and a flattened peripheral portion surrounding said main portion along a junction area therewith; centering means for centering the lens on said surface; means for applying in said junction area suction to said lens so as to draw said marginal portion thereof into contact with said peripheral portion to thereby temporarily flatten and position it for proper working; and working means for working said marginal portion of the lens centered on said surface.

3,978,621

MACHINE FOR SURFACE-, PLANE-PARALLEL-, AND PLAIN LAPPING

Jos M. Janssen, Mettmann, Germany, assignor to JMJ Werkzeugmaschinen GmbH fuer Feinbearbeitung, Mettmann, Germany

Filed Aug. 15, 1975, Ser. No. 605,156
Claims priority, application Germany, Aug. 27, 1974, 2440978
Int. Cl.² B24B *37/04*, *57/00*
U.S. Cl. 51—111 R 9 Claims



1. In a two wheel lapping machine, having two lapping- and working-wheels, respectively, which are mounted on one lapping wheel carrier each, the latter including an upper lapping wheel carrier mounted on a lower end of a main spindle and formed with a first circularly shaped channel means for feeding lapping abrasive via a dosing device to a work piece, the improvement comprising

at least one second circularly shaped channel means formed in said upper lapping wheel carrier for feeding of lapping abrasive to said work piece, said at least one second channel means being concentric to said first channel means and having a different diameter than that of said first channel means.

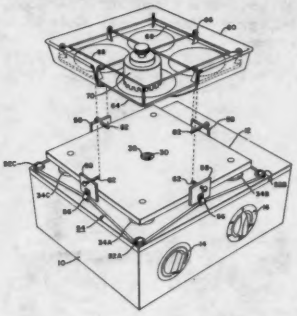
3,978,622

LAPPING AND POLISHING APPARATUS

Robert G. Mazur, Monroeville; Gilbert A. Gruber, Pittsburgh, and Robert C. Stephenson, North Irwin, all of Pa., assignors to Solid State Measurements, Inc., Monroeville, Pa.

Filed July 23, 1975, Ser. No. 598,181
Int. Cl.² B24B *7/00*
U.S. Cl. 51—119 7 Claims

1. Apparatus for abrading a workpiece comprising drive motor means provided with a vertical rotatable shaft having connected thereto an eccentric arm, a support plate centrally connected to said eccentric arm at a point removed from said shaft whereby rotation of said shaft will effect an oscillatory eccentric movement of said support plate in a generally horizontal plane, stationary pin means arranged at spaced points around the periphery of said support plate, resilient means connecting the respective pin means to points on the support plate intermediate the pin means, and a lapping and polishing tray disposed on said support plate whereby a workpiece on the tray will be oscillated in a random manner due to the



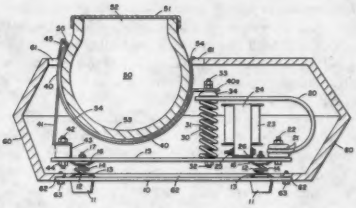
eccentric movement of the support plate and tray to abrade the surface of the workpiece in contact with the tray.

3,978,623

APPARATUS FOR VIBRATORY POLISHING OF STONES AND THE LIKE

Edward Earl Smith, New London, Iowa, assignor to Geode Industries, Inc., New London, Iowa

Filed Aug. 16, 1974, Ser. No. 498,070
Int. Cl.² B24B *31/06*
U.S. Cl. 51—163.1 7 Claims



1. An apparatus for the polishing of material such as stones and the like including a container for the material and abrasive medium, the container having a wall with an inner containing surface arcuate with respect to a first generally horizontal axis, the improvement comprising: first means supporting the container at a first location adjacent said wall laterally disposed in one direction from the first axis, the first supporting means providing for reciprocal movement of the container in a first direction which is substantially horizontal only and transversely of the first axis; second means supporting the container at a second location adjacent said wall laterally disposed in the opposite direction from the first axis, the second supporting means providing for reciprocal movement of the container in a second direction which is substantially inclined between vertical and horizontal directions and generally toward and away from a vertical plane containing the first axis, the first and second supporting means being operatively connected for conjoint movement thereof in said respective first and second directions, said movement of one of the supporting means imparting said movement of the other of the supporting means thereto; and power means providing vibratory movement of one of the supporting means in its said direction, said movements of the first and second supporting means being imparted to the container.

3,978,624

DEVICE FOR ENDING THE FEED MOVEMENT OF A GRINDING WHEEL

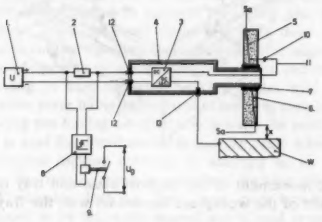
Rudolf Merkel, Coburg-Scheuerfeld; Friedrich Schnell, and Ewald Weber, both of Coburg, all of Germany, assignors to Werkzeugmaschinenfabrik Adolf Waldrich Coburg, Coburg, Germany

Filed May 7, 1975, Ser. No. 575,270

Claims priority, application Germany, May 11, 1974, 2422940

Int. Cl.² B24B *49/10*

U.S. Cl. 51—165.92 11 Claims



1. In a device for terminating the relative feeding movement between a rotating grinding wheel carried by a rotatable tool spindle and a workpiece, the improvement comprising wherein said rotating grinding wheel has a plurality of electrical conductors insulated with respect to the material of said grinding wheel, the free ends of said conductors terminating at the active surface of said grinding wheel, rotatable voltage transformer means rotating with said tool spindle and generating an impulse characteristic between said free ends of said conductors and said workpiece surface, said voltage transformer means having a primary circuit and a high voltage secondary circuit and a low voltage secondary circuit, one side of both of said high voltage and low voltage secondary circuits being selectively electrically connected to said conductors and the other side thereof to said workpiece, feed drive means for effecting a relative movement between said grinding wheel and said workpiece at least toward each other, said feed drive means having a pair of differing speed characteristics so that said relative movement at one speed is faster than at the other speed, said high voltage circuit being electrically connected to said conductors when said feed drive means effects said fast relative movement between said grinding wheel and said workpiece, threshold switch means responsive to a spark discharge across a predetermined liquid free gap between said grinding wheel and said workpiece when said fast relative movement is occurring between said grinding wheel and said workpiece for (1) simultaneously switching said connection between said high voltage secondary circuit and said conductors to a connection between said low voltage second circuit and said conductors and (2) switching said feed drive means to the slower one of said speeds of relative movement.

3,978,625

GRINDING WHEEL COOLANT NOZZLE

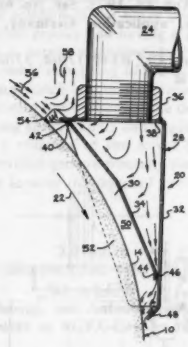
William P. Klaassen, Brooklyn, Mich., assignor to Teer, Wickwire & Company, Jackson, Mich.

Filed Feb. 18, 1975, Ser. No. 550,756

Int. Cl.² B24B *55/02, 1/00*

U.S. Cl. 51—267 6 Claims

1. A grinding wheel cooling system characterized by its ability to remove the moving air film and loose particles adjacent the grinding surface of a rotating grinding wheel and apply a cooling liquid directly thereto comprising, in combination, a rotary grinding wheel having a grinding surface including a circular periphery and width, first nozzle means ejecting a first flow of cooling liquid directly on the grinding surface of the grinding wheel at a first surface location, said first nozzle means and thus said flow of cooling liquid being obliquely disposed to the grinding wheel grinding surface at said first surface location in a direction counter to the direction of movement of said grinding wheel surface at said first surface location to counteract and remove the moving film of air and



loose particles adjacent said periphery at said first location, and said second nozzle means ejecting a second flow of cooling liquid upon said grinding wheel surface at a second surface location behind said first location with respect to the direction of grinding wheel surface movement to cool said grinding surface.

3,978,626

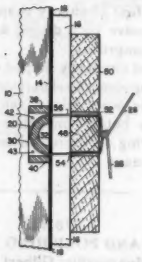
REMOVABLE WIRE TIE FOR ADHESIVE APPLIED WALLBOARD INSTALLATION

Roger N. Weinar, 196 Greenfield Drive, Tonawanda, N.Y. 14150

Filed May 14, 1975, Ser. No. 577,215

Int. Cl.² E02D *35/00;* E04B *1/00*

U.S. Cl. 52—127 10 Claims



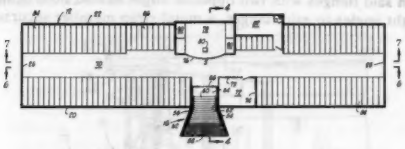
1. In combination, an elongate wall framing member and an arcuate tie wire support, said framing member having a substantially flat front face, a pair of spaced-apart holes extending through said face, an arcuate rigid support surface disposed within said framing member, with the two ends of said arcuate surface being disposed immediately behind the respective two holes of said pair of holes, and a wire disposed with an arcuate portion around said arcuate surface and extending outward through said two holes, whereby said wire is suitably held in place when equal tension is applied to the ends of said wire and is readily removable when light tension is applied to only one end of said wire.

3,978,627

BURIAL FACILITY

Clyde C. Booth, 6001 Northwest Highway, Suite 400, Oklahoma City, Okla. 73132

Filed May 12, 1975, Ser. No. 576,587
Int. Cl.[2] E04H *13/00*
U.S. Cl. 52—136 8 Claims



1. A burial facility comprising:

a rigid burial housing of generally right parallelepiped configuration having a portion disposed below ground level and a portion projecting above ground level;

walls and partitions within said housing defining:

a plurality of tiers of interment crypts;

a concourse extending between said tiers of crypts;

a plurality of rooms including a viewing room positioned adjacent said concourse and having glass paneling along one side thereof facing said concourse to enable persons in said viewing room to view the area within said burial housing across said concourse from said viewing room; and

funeral services facilities including a space defined by said walls and partitions across said concourse from said viewing room to facilitate viewing by persons in said viewing room of funeral services conducted at the locus of said funeral services facilities;

a generally frusto-pyramidal earthen mound covering and concealing that portion of said housing which projects above ground level and including four sloping earthen walls inclined with respect to the vertical; and

a downwardly sloping entryway extending through one side of said frusto-pyramidal earthen mound and communicating through an opening in one side of said housing with the interior thereof, said entryway communicating through the opening in said one side of said housing directly with said concourse at a location immediately adjacent said viewing room and in direct alignment with said funeral facilities on the opposite side of said concourse therefrom; and

a layer of particulate aggregate material positioned between the outer side of the walls and roof of said housing and the earth of said frusto-pyramidal earthen mound.

3,978,628

CONSTRUCTIONAL UNITS FOR STEPPED STRUCTURES

Jack Turner, High Rise, Highgate Lane, Whitworth, New Rochdale, Lancashire, England

Continuation of Ser. No. 440,077, Feb. 6, 1974, abandoned. This application Aug. 14, 1975, Ser. No. 604,817
Claims priority, application United Kingdom, Feb. 20, 1973, 8221/73
Int. Cl.[2] E04F *11/00*
U.S. Cl. 52—188 6 Claims

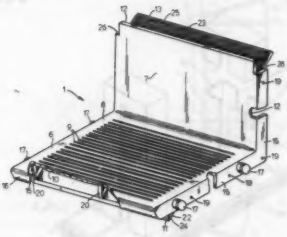
1. An adjustable step unit for assembly with at least one similar unit and a pair of laterally spaced apart stringers disposed along the sides of said unit to form a staircase whose height and length can be varied without changing the pitch angle of the staircase, comprising:

a horizontal tread comprising upper and lower surfaces and front and rear edges;

a vertical riser comprising front and rear surfaces and upper and lower edges;

said riser having its lower edge joined to the rear edge of said tread and extending upwardly therefrom;

a first member joined to the rear surface of said riser near the upper edge thereof and extending upwardly and rearwardly from said rear surface, said first member having an inclined upwardly facing surface with a plurality of first slots formed thereon;



a second member joined to the lower surface of said tread near the front edge thereof and extending downwardly and forwardly from said lower surface, said second member having an inclined downwardly facing surface with a plurality of different positions with the first slots on a similar step unit in a staircase;

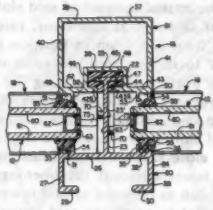
and means at the sides of said unit for securing said unit to said stringers of said staircase.

3,978,629

THERMAL BARRIER CURTAIN WALL

Charles W. Echols, Sr., College Park, Ga., assignor to The William L. Bonnell Company, Newnan, Ga.

Filed Apr. 16, 1975, Ser. No. 568,480
Int. Cl.[2] E04H *1/00*
U.S. Cl. 52—235 24 Claims



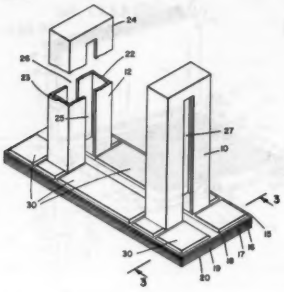
1. In a curtain wall or wall framing system for a building or the like including vertical mullions and horizontal mullions, the improvement therein wherein the vertical mullions comprise a metal exterior member and an interior metal member joined together by an insulating member or medium to form a unitary thermal break vertical mullion, insertion means on said exterior member integrally formed therewith for mating with said interior member and receiving means on Said interior member integrally formed therewith receiving said insertion means of said exterior member, said insertion means and said receiving means being adapted to be slidably or longitudinally mated with each other, and when said insertion means and said receiving means are mated with each other, lateral separation of said exterior and interior members is prohibited.

3,978,630

CENTRAL TOWER BUILDING WITH GROUND CONSTRUCTED HOISTED AND SUPPORTED FLOORS

Allan S. Labie, New York; Irwin Paul Lew, Forest Hills; Abraham Gutman, Old Bethpage, and Charles Thornton, Pleasantville, all of N.Y., assignors to International Environmental Dynamics, Inc., New York, N.Y.

Filed Mar. 4, 1975, Ser. No. 555,312
Int. Cl.[2] E04B *1/34*; E04G *21/00*; E04B *1/35*
U.S. Cl. 52—236 4 Claims



1. An improved method of constructing a building of multiple ground constructed hoisted and supported floors, said method comprising the steps of: constructing at least one tower having an interior hollow core, said tower defining in sidewalls of said tower paired, vertically extending slots on opposing sidewalls of said tower to define confronting C-shaped sections of said tower separated by said intervening slots there between, said slots extending from the base of said tower continuously towards the top of said tower to the intended elevation of the highest of said supported floors; constructing horizontal floor slabs at a position proximate the base of said tower, each said slab having a major portion immediately circumscribing the outer periphery of said tower and a secondary portion contiguous to the major portion bridging between the slots in said tower to define at least a portion of the floor interior of said tower and said secondary portion spanning the spatial interval of said slots to fully occupy the section of said slot at said floor; raising said constructed horizontal floor slab from its position proximate the base of said tower to its intended elevation on said tower whereby said major portion circumscribing the outer periphery of said tower prevents outward deflection of said tower to open said slots, and said secondary portion spanning the spatial interval of said slots prevents inward movement of said tower sidewalls to close said slots; and, fastening the raised floor slab to said tower adjacent the openings of said slot whereby said floor slab as fastened to said tower cross braces said tower at said slot to reinforce said tower and simultaneously to support said floor slab.

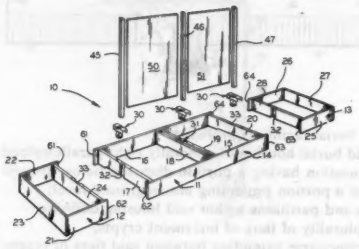
3,978,631

DISPLAY UNITS WITH SOCKET-MOUNTED STANDARDS

Warren H. Diersing, Lincoln, Ill., assignor to Myers Industries, Inc., Lincoln, Ill.

Filed Aug. 4, 1975, Ser. No. 601,796
Int. Cl.[2] E04H *1/00*, *3/00*
U.S. Cl. 52—239 6 Claims

1. A merchandising display unit comprising a horizontal base with horizontal frame members on opposite sides of the base and connected by a plurality of cross frame members, at least one of said cross frame members being a pair of elongated sheets or boards arranged in a contiguous but horizontally spaced, parallel pair, each pair having horizontally spaced, opposed faces lying in respective substantially vertical planes, a pair of opposed, vertically extending grooves each having a vertical bottom wall and planar vertical side walls in said respective opposed faces to provide a vertical socket, a standard-mounting unit embodying a plate having two spaced flanges depending from a horizontal cross wall, said flanges respectively lying against the outermost sides of respective sheets or boards of said pair to hold said sheets or boards together as a pair unit, said horizontal cross wall having a rectangular hole therein positioned substantially midway between said flanges with two opposite edges of said hole being at right angles to said flanges, a metal strap member secured



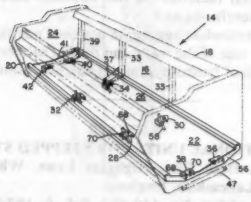
to said horizontal cross wall, said strap member having two, vertical, flat strap legs respectively directly below said respective two opposite edges, said strap legs being at substantially right angles to said flanges, said strap member being seated in said socket with the side edges of said strap legs lying against the respective side walls of said grooves, and a vertical standard having a lower end of substantially rectangular, overall transverse cross section extending downwardly through said rectangular hole with one pair of opposed sides of said lower end lying against and snugly supported by said strap legs and the other pair of opposed sides lying against and supported by said bottom walls of said opposed grooves.

3,978,632

FOAM PLASTICS DISPLAY UNIT

Roger C. Ansted, San Antonio, Tex., assignor to Friedrich Air Conditioning & Refrigeration Co., San Antonio, Tex.

Filed Nov. 11, 1974, Ser. No. 522,684
Int. Cl.[2] E04C *2/22*
U.S. Cl. 52—309 1 Claim



1. A display unit comprising an inner skin, an outer skin extending in a spaced relation to said inner skin, two end pieces secured to said skins at the ends of the space between said skins, a plurality of support plates located in said space with at least a portion of said plates being secured to said end pieces, a hardened foam plastic material extending in said space and surrounding at least a portion of each of said plates for bonding said skins and said plates relative to each other and forming a unitary structure, a plurality of support brackets for supporting additional components of said display unit, and screw means extending through said support brackets, at least one of said skins, a portion of said foam plastic, and into said plates for securing said support brackets to said structure.

3,978,633
BUILDING ELEMENT

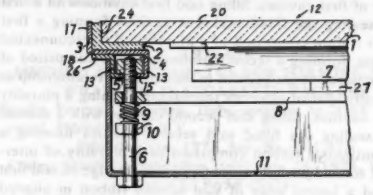
Herwig Scheidler, Mainz, and Klaus Kristen, Wiesbaden, both of Germany, assignors to Jenaer Glaswerk Schott & Gen., Mainz, Germany

Filed Jan. 14, 1975, Ser. No. 540,967

Claims priority, application Germany, Jan. 18, 1974, 7401645[U]; Japan, Feb. 27, 1974, 7406776[U]

Int. Cl.² E04B 1/62

U.S. Cl. 52—400 **7 Claims**



1. The combination of a base and a construction element comprising:

a sheet of material having a generally plane front surface, a back surface generally parallel to the front surface, and a planar edge defining the perimeter of and joining the front and back surfaces, and

an attachment means secured to the back surface of the sheet adjacent to the edge of the sheet for attaching the sheet to the base, the attachment means comprising

a frame having two spaced apart flanges arranged substantially perpendicularly to the back surface of the sheet and parallel to each other, each flange having a rim closing toward the opposite flange defining an aperture for receiving a threaded element for securing the construction element to the base,

a homogeneous, permanently resilient adhesive substance positioned between the frame and the sheet having sufficient flexibility to allow for the difference in thermal expansion between the frame and the sheet and having sufficient adhesive strength to hold the sheet to the frame, and

means situated between the sheet and the base for biasing the sheet with respect to the base in a frontward direction away from the base.

3,978,634
SCAFFOLDING CONSTRUCTIONS

Roy Mack, Birmingham, and Terence William Mayo, Redditch, both of England, assignors to Kwikform Limited, Birmingham, England

Filed July 17, 1975, Ser. No. 596,594

Claims priority, application United Kingdom, July 19, 1974, 32013/74

Int. Cl.² E04H 12/08

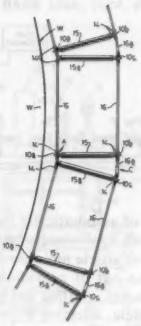
U.S. Cl. 52—646 **6 Claims**

1. In a scaffolding structure comprising

a. a plurality of generally vertical uprights arranged in horizontally spaced parallel pairs and each provided at spaced intervals along their lengths with groups of sockets, and

b. cross members each including at opposed ends thereof connecting means firmly engaging selected ones of said sockets, the cross members comprising firstly transom elements extending between the uprights of said pair and secondly ledger elements extending between the uprights of adjacent pairs, whereby staging can be supported between adjacent pairs of said uprights, the improvement comprising

c. at least one additional cross member having at one end connection means for firmly engaging a socket afforded by one of said uprights mounted for pivotal movement about a vertical axis, such additional, pivoted cross member extending at an angle other than a right angle relative to one of said transom elements which extends between the uprights of one of said pairs of uprights whilst connected to another socket of the same group as that to which the pivoted cross member is connected, and



d. an additional socket, similar to the sockets afforded by the uprights, is provided at said one end of the pivoted cross member with one of said ledger elements connected at one of its ends to said additional socket on said pivoted cross member.

3,978,635
SELF-SUPPORTING ELEMENT FOR ROOF STRUCTURES AND COMBINATIONS THEREOF

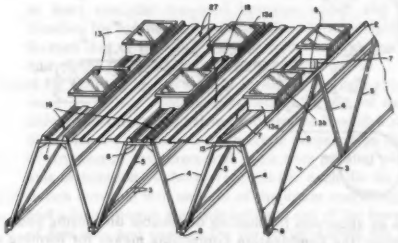
Yves Theault, 51, rue de Bellevue, 14 - Caen, France

Filed Sept. 17, 1973, Ser. No. 398,170

Claims priority, application France, Sept. 19, 1972, 72.33094

Int. Cl.² E04C 3/02

U.S. Cl. 52—693 **8 Claims**



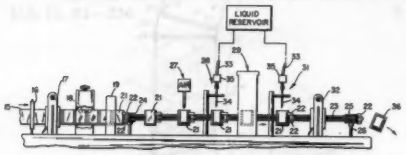
1. A self-supporting elongated structural element for supporting the roof of a building which is adapted to rest by at least each one of its two opposite ends on a rigid horizontal superstructure and which includes at least four profiled longitudinal ribs extending horizontally and being disposed symmetrically two by two sloping outwardly with respect to a vertical longitudinal plane of symmetry, the two upper ribs being united by horizontal individual beam members on the one hand and each pair of ribs on the same side of said plane of symmetry on the other hand being joined by a lattice framework means to provide an upper beam and two side trusses, respectively, the bottom being open and unobstructed so that said elements can be stacked on top of one another.

3,978,636

METHOD AND APPARATUS FOR THE PACKAGING OF MOIST ARTICLES

David Clancy, Canaan, Conn., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Sept. 11, 1972, Ser. No. 287,735
Int. Cl.[2] B65B 9/2, 25/00
U.S. Cl. 53—21 FW 8 Claims



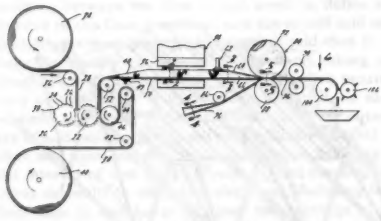
1. In the method of automatically making sealed compartmented packages with each compartment containing a towelette or like absorbent article moistened with a liquid in which the steps are carried out of providing a series of open top envelope compartments, stuffing each compartment with a towelette or like article, injecting a quantity of liquid therein and heat sealing the open top thereof, the improvement comprising, injecting part of the required amount of liquid into each envelope compartment, thrusting the towelette or like article into each envelope compartment, injecting the required balance of liquid into each towelette-containing envelope compartment, and then sealing the open top of each filled towelette-containing envelope compartment.

3,978,637

METHOD AND APPARATUS FOR MAKING PACKET ASSEMBLIES

Francis G. Mauriello, Malden, Mass., assignor to Diamond Crystal Salt Company, St. Clair, Mich.

Filed Oct. 24, 1975, Ser. No. 625,523
Int. Cl.[2] B65B 9/04, 43/06
U.S. Cl. 53—28 9 Claims



1. In an apparatus for making disposable dispensing packet assemblies, the combination comprising means for forming a first continuous web comprised of a pair of opposed strips bonded in face-to-face relationship at longitudinally spaced intervals therealong defining a plurality of first cavities, means for filling said first cavities with a first material, means for sealing the filled said first cavities forming a first continuous ribbon comprised of a plurality of interconnected first packets, means for forming a second continuous web comprised of a pair of opposed strips bonded in face-to-face relationship at longitudinally spaced intervals therealong defining a plurality of second cavities, means for filling said second cavities with a second material, means for sealing the filled said second cavities forming a second continuous ribbon comprised of a plurality of interconnected second packets, means for orienting a lateral edge of said first ribbon and a lateral edge of said second ribbon in aligned adjacent relationship, means for transversely aligning said first packets and said second packets, means for bonding said first ribbon to said second ribbon with said first and said second packets in transversely aligned relationship forming a composite ribbon, and means for transversely severing said composite ribbon into sections each comprising a packet assembly consisting of an interconnected said first and said second packet.

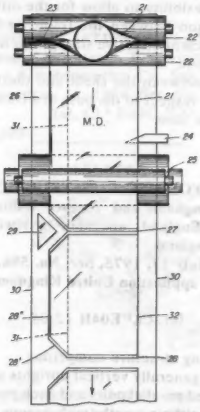
9. A method for making disposable packet assemblies which comprises the steps of forming a first continuous web comprised of a pair of opposed strips bonded in face-to-face relationship at longitudinally spaced intervals therealong defining a plurality of first cavities, filling said first cavities with a first material, sealing the filled said first cavities forming a first continuous ribbon comprised of a plurality of interconnected first packets, forming a second continuous web comprised of a pair of opposed strips bonded in face-to-face relationship at longitudinally spaced intervals therealong defining a plurality of second cavities, filling said second cavities with a second material, sealing the filled said second cavities forming a second continuous ribbon comprised of a plurality of interconnected second packets, orienting a lateral edge of said first ribbon and a lateral edge of said second ribbon in aligned adjacent relationship, transversely aligning said first packets and said second packets, bonding said first ribbon to said second ribbon with said first and said second packets in transversely aligned relationship forming a composite ribbon, and transversely severing said composite ribbon into sections comprising a packet assembly consisting of an interconnected first and second packet.

3,978,638

PACKAGE CONSTRUCTION OF ARTICLES WITH SHRINK FILM

Walter H. Sether, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. Nos. 65,562, Aug. 20, 1970, abandoned, and Ser. No. 280,020, Aug. 11, 1972, abandoned. This application May 7, 1974, Ser. No. 467,759
Int. Cl.[2] B65B 43/04, 53/02
U.S. Cl. 53—30 S 2 Claims



1. A method of wrapping a pallet load comprising forming a biaxially oriented shrinkable, thermoplastic film, and providing a greater degree of orientation and therefore a greater shrinkability in a first direction than in a second direction, from said film forming a plastic bag having front and rear walls joined to each other along a pair of opposite edges to define an internal bag enclosure having an open mouth, a continuous square bottom containing a gusset and tabs removably attached to and extending from the joined opposite edges directed toward said gussetted bottom, said bag being formed

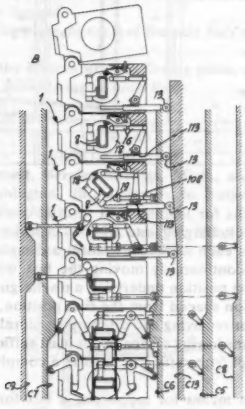
with said open mouth substantially parallel to said first direction of said film; suspending a plurality of said bags from said tabs in a mouth downward orientation; disposing a loaded pallet below and in substantial vertical alignment with said bags; downwardly propelling a bag with sufficient force to disengage such from said tabs and overwrapping said pallet and load therewith; and heating said overwrapped pallet load sufficient to shrink said bag thereabout, said shrunk bag exerting greater force on said load in a direction substantially parallel to said mouth than in a direction substantially perpendicular to said mouth.

3,978,639

METHOD AND APPARATUS FOR FORMING PACK WRAPPERS IN CIGARETTE PACKERS

Claudio Ferrozzi, Ferrara, Italy, assignor to AMF Incorporated, White Plains, N.Y.

Filed Jan. 16, 1975, Ser. No. 541,473
Claims priority, application Italy, Jan. 24, 1974, 12443/74
Int. Cl.² B65B 19/24
U.S. Cl. 53—32 9 Claims



1. A method for forming and closing pack wrappers in cigarette packers comprising the steps of:

providing a set of packmaking devices each with a tube-shaped box and a set of pack closing devices, the devices of each set being connected to one another and continuously driven along a closed path at least in part adjacent the path of the other set of devices.

forming a foil sheet around each tube shaped box and folding a pair of opposed flaps at one end of said sheet at the bottom of the pack wrapper being formed,

forming a wrapper sheet around each foil sheet which together provide a pack wrapper,

rotating each tube shaped box and pack wrapper thereon to change its orientation relative to the path of said packmaking devices and folding the bottom flaps of the pack wrapper thereby closing one end thereof,

returning each tube shaped box and pack wrapper thereon to its original orientation relative to the path of said packmaking devices and filling each pack wrapper,

transferring each filled pack wrapper from a packmaking device to an adjacent pack closing device and pivoting each filled pack wrapper to change its orientation to the path of said packmaking devices while folding the flaps at the mouth end thereof, and

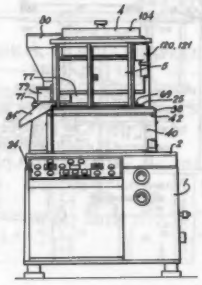
thereafter returning each pack wrapper to its original orientation.

3,978,640

HARD-GELATIN CAPSULE FILLING MACHINES

Jack Crossley, and David Henry Wilson, both of Liverpool, England, assignors to Manesty Machines, Ltd., Liverpool, England

Filed Sept. 10, 1974, Ser. No. 504,766
Claims priority, application United Kingdom, Sept. 11, 1973, 42616/73
Int. Cl.² B65B 1/04, 1/24, 43/50
U.S. Cl. 53—37 64 Claims



1. A hard-gelatin capsule filling machine for filling two piece capsules comprising:

an uncapping station for uncapping capsule, means for compressing a quantity of fill into a soft slug, a filling station for inserting the slug into the bottom part or body of the capsule, a re-capping station for recapping the body part, and an ejection station for thereafter ejecting the filled capsule in a single, continuously rotating phase of the machine;

said filling station comprising fill forming means including at least one die mounted between upper and lower punches for forming each slug of fill and for delivering the formed slug of fill into a capsule body through the lower end of the die by the upper punch;

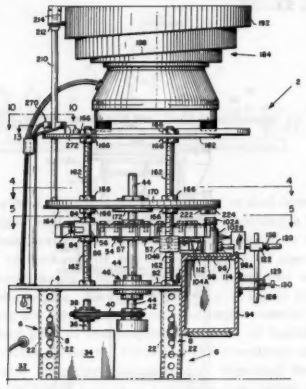
said fill forming means further including a single rotatable turret, which is continuously rotated in use of the machine, the turret comprising a die table having a ring of dies lying on a common pitch circle centered on the axis of rotation of the turret with their axes parallel with the axis of rotation of the turret, and for each die an upper punch movable into and out of the upper end of said die, and a lower punch movable into and out of the lower end of said die; and cam means for reciprocating the lower punches as the turret rotates to advance each lower punch from a withdrawn position relative to its die, into its die to a first position therein in which its tip lies flush with the upper end of the die, thereafter to withdraw the punch to a second position in its die to assist in drawing fill from the die table into the die, thereafter to advance the punch to a second position in its die to eject a quantity of fill from the die and leave a predetermined metered dose of fill in the die, thereafter to withdraw the punch to a third position in its die to prevent spillage of the metered dose of fill material from the die during movement of the upper punch associated with the die into the upper end of the die, thereafter to advance the punch to a fourth position in its die to form a soft slug of the metered dose of fill material in the die and thereafter to return the punch to said withdrawn position.

3,978,641

MACHINE FOR SUPPLYING ARTICLES TO OPEN TOP CONTAINERS

Werner L. Tollefsbol, Delran, N.J., assignor to Dower, Inc., Delran, N.J.

Filed June 24, 1975, Ser. No. 589,685
Int. Cl.[2] B67B 57/16
U.S. Cl. 53—53 7 Claims



1. A machine for supplying articles to open top containers on a moving conveyor comprising:

means including a horizontal wheel adjacent the conveyor having paddles spaced to trap a container between each adjacent pair of paddles to control the movement of the containers adjacent said wheel,

a rotatable horizontal disc mounted above said wheel and having a plurality of vertical openings through the disc each for the reception of an article,

a fixed plate between the disc and the wheel to retain the articles in said openings, a portion of the plate over the conveyor being cut away to permit the release of the articles from the said openings into the containers,

means to rotate the wheel and the disc at the same angular rate, and

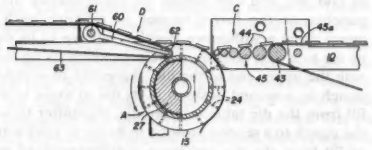
means to supply an article to each opening in the disc.

3,978,642

METHOD AND MACHINE FOR PACKING STRIPS OF MATERIAL

James P. Smithers, Glen Ellyn, Ill., assignor to Armour and Company, Phoenix, Ariz.

Filed Feb. 28, 1974, Ser. No. 446,588
Int. Cl.[2] B65B 35/30; B65G 47/08
U.S. Cl. 53—159 3 Claims



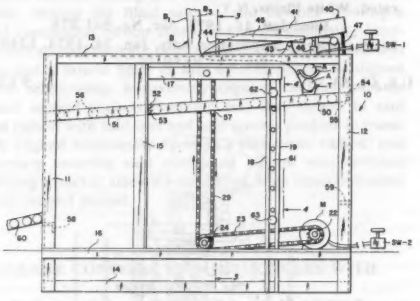
1. A machine for packing strips of material comprising a roll having a cylindrical outer surface, means for passing a film continuously upwardly and over the top of said roll with said film in contact with said roll at an area of said outer surface which area is moving forwardly and upwardly, said roll containing passages therein leading from the interior of said roll to the underside of said film, means for withdrawing air through said passages to thereby draw said film tightly to said surface at said area, means for delivering said strips onto said film over said forwardly and upwardly moving area, means for blocking said passages at an area on the surface of said roll where said passages are moving forwardly and downwardly, and means for picking up and removing said film with said strips thereon at said last mentioned area.

3,978,643

FRUIT LOADING APPARATUS

Riley L. Jones, Hendersonville, N.C., assignor to Thomas L. Tatham Farm, Inc., Miami, Fla.

Filed July 3, 1974, Ser. No. 485,534
Int. Cl.[2] B65b 35/22; B65B 35/50
U.S. Cl. 53—160 13 Claims



1. Apparatus for loading fruit into an open sided box by successively discharging into the box a series of batches or pieces of fruit each sufficient to form a complete layer in the box and by continuously moving the box without stopping between a first position underlying a discharging means and a second position spaced from the first position, comprising:

a. means for receiving and discharging plural pieces of fruit; said means having a capacity at least sufficient to receive a batch of fruit sufficient to form a complete layer in the box;

b. platform means for supporting a box for uninterrupted movement between a first position substantially underlying said first mentioned means in which position discharge of a batch of fruit thereinto is initiated, and a second position laterally spaced from said first position, said platform means having a first portion underlying said receiving and discharging means and a second portion laterally thereof for supporting a box in said second position;

c. elevator means for supporting and step-lowering said platform, and

d. means for causing said first mentioned means to discharge a said batch of fruit therefrom into a box on said first portion of said elevator means whereby to discharge a batch of fruit sufficient to form a complete layer into the box,

e. said apparatus being free of means for stopping the continuous movement of said box between said first and second positions, whereby a box may be continuously moved without stopping between said positions.

3,978,644

SADDLE

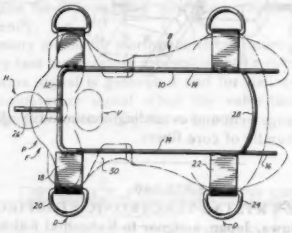
Jon G. Hillman, Rte. 1, Box 151, Big Spring, Tex. 79720

Filed Sept. 9, 1975, Ser. No. 611,619
Int. Cl.[2] B68C 1/00
U.S. Cl. 54—44 15 Claims

1. Reinforcing structure for a saddle comprising:

a. a stainless steel frame having

b. a fork bight at the fork of the saddle and
c. two side bars extending along the tree bars of the saddle,
d. the side bars being substantially straight and parallel, thus, lying in a horizontal plane,
e. the fork bight bend upward from the plane containing the side bars,

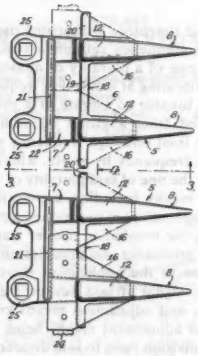


f. a front D-ring plate on each of the side bars at the forward most point thereof,
g. a rear D-ring plate on each of the side bars near the back thereof,
h. a loop in the bottom of each D-ring plate, and
j. a stainless steel D-ring in each loop.

3,978,645
SICKLE GUARD

George H. Bennett, Berrien Springs, Mich., and Wilbur L. Pringle, Washington, Ill., assignors to National-Standard Company, Niles, Mich.

Filed June 27, 1975, Ser. No. 591,160
Int. Cl.² A01D *55/10*
U.S. Cl. 56—310 **9 Claims**



1. In a unitary forged sickle guard having at least one longitudinally extending guard finger for use in a mower having sickle means including:

mounting means for supporting flat cutter sections for movement transversely of said guard finger, wherein said guard finger has a bottom body portion having an upper ledger surface, the ledger surface of said guard finger lying in a horizontal plane and having cutting edges at each of the sides thereof,

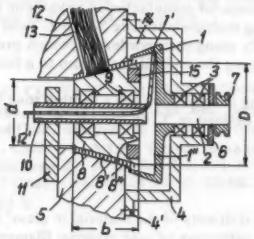
trash bar means extending at the rear of said cutting edges of said ledger surface, said trash bar means having a machined upper horizontal surface means lying in said horizontal plane of said ledger surface and having cutting edge means provided by the machining of said trash bar means at the forward portion thereof, said cutting edges of said ledger surface and said trash bar means being integral thereto to provide a continuous cutting edge, and

wear plate means extending transversely of said guard finger rearwardly of said trash bar means, said wear plate means having an upper surface lying in the plane of said ledger surface, said ledger surface and said upper horizontal surface means of said trash bar means and said upper surface of said wear plate means providing support for the cutter sections of the sickle means for movement with respect to said guard finger and in cutting relation to said cutting edges of said ledger surface and the cutting edge means of said trash bar means.

3,978,646
CONTROL OF BREAK-UP ROLLER SPEED IN OPEN-END SPINNING UNIT

Herbert Hoffmann, Bremen; Rolf Neubert, Schwanewede (Beckedorf), and Friedrich Wachendorf, Schwanewede, all of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Apr. 25, 1975, Ser. No. 571,628
Claims priority, application Germany, May 6, 1974, 2421783
Int. Cl.² D01H *1/12*
U.S. Cl. 57—58.95 **15 Claims**



8. In an open-end spinning unit having a coaxially mounted spinning rotor and a break-up roller which is free of mechanical connection to any drive system and which is mounted to be freely rotatable, the break-up roller being caused to rotate by a force transmission from the coaxially mounted spinning rotor of the unit without any mechanical contact between the roller and the rotor, the improvement wherein said break-up roller has a circumferential surface constituted by a comb wherein rotation of said roller causes said comb to produce ventilation losses constituting a variable retarding force applied to said break-up roller to produce a braking moment while preventing mechanical connection between said roller and any stationary body, and said roller is dimensioned and said comb is formed to cause the retarding force produced by said ventilation losses to have a value which corresponds to the force applied to drive said roller at a selected roller rotation speed.

3,978,647

HIGHLY COHERENT AND RIGID SYNTHETIC MULTIFILAMENTARY YARN AND PROCESS FOR MANUFACTURING THE SAME

Kenzo Kosaka; Toshio Horikawa; Minoru Uchida; Shin Morioka; Kunio Shibata, and Eizi Takahashi, all of Nagoya, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 315,554, Dec. 15, 1972, abandoned. This application Mar. 12, 1975, Ser. No. 557,453

Claims priority, application Japan, Dec. 20, 1971, 46-102587; Dec. 21, 1971, 46-103231

Int. Cl.² D02G *1/02, 3/26*

U.S. Cl. 57—140 R 10 Claims

1. Highly coherent and rigid synthetic multifilamentary yarn of improved functional properties, composed of a single multifilamentary strand, comprising multiple alternate S- and Z-twist regions of irregular lengths formed by false twisting and retained successively along the yarn length, some of the component filaments of said yarn being partially fused and adhered to each other and the extent of fusing and adhesion and the number of twists of each of the regions having twists of the same direction as the twisting direction being greater than those of the regions having twists of the opposite direction to said twisting direction.

6. A process for manufacturing a synthetic multifilamentary yarn having multiple alternate S- and Z- twist regions retained successively along the yarn length, which process comprises

1. supplying the multifilament yarn to a false-twisting apparatus,
2. passing the yarn through a heating zone having a temperature defined in °C by the equation:

$$\rho + 10\,\Delta n \leqq 0.015\,T - 0.800$$

and

$$T \leqq 260$$

wherein ρ is density of the material in g/cm³ and Δn is degree of double refraction of said material filament, the individual filaments of the yarn being softened and partially melted such that regions are formed wherein the filaments are intermittently fused and adhered to each other in a twisting direction,

3. passing the yarn in a heated condition through the false-twisting apparatus, whereby regions are formed after passing through the apparatus wherein the individual filaments are substantially unfused and are twisted in a direction opposite to the twisting direction, and
4. recovering the resulting yarn.

3,978,648

HELICALLY WRAPPED YARN

Seiichi Yamagata, and Kozo Susami, both of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

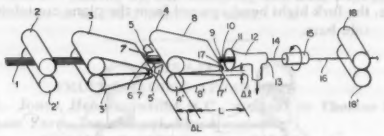
Filed Apr. 9, 1974, Ser. No. 459,396

Claims priority, application Japan, Apr. 10, 1973, 48-39991

Int. Cl.² D02G *3/36, 3/38*

U.S. Cl. 57—144 8 Claims

1. A helically wrapped yarn which comprises a bundle of core fibers comprising substantially non-twisted staple fibers, and wrapped staple fibers disposed around said bundle of staple core fibers, said wrapped fibers being helically wrapped around the surface only of said core staple fibers, and being wrapped at a regular helical angle, and not extending into the bundle of core fibers, said wrapped fibers being positioned in



an orderly arrangement and extending continuously along the length of the bundle of core fibers.

3,978,649

QUARTZ CRYSTAL ELECTRONIC TIMEPIECE

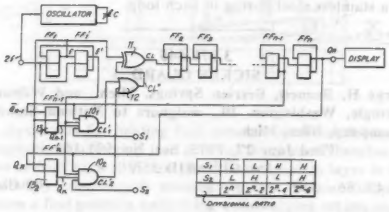
Okito Naito, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed July 22, 1974, Ser. No. 490,550

Claims priority, application Japan, July 20, 1973, 48-80583

Int. Cl.² G04C *3/00*

U.S. Cl. 58—23 R 9 Claims



1. An electronic timepiece comprising oscillator means for producing a high frequency reference signal, said oscillator means including one of a plurality of quartz crystal vibrators each capable of vibrating at a different frequency, said oscillator means being tunable to vibrate at a predetermined high frequency selected from a group including a desired high frequency and at least one high frequency which varies from said desired high frequency by m Hz, where m is an integer, as determined by the one of said plurality of vibrators included therein; divider means including a plurality of series-connected divider stages adapted to produce a predetermined low frequency signal, the number of divider stages determining a division ratio for producing said predetermined low frequency signal in response to the application thereto of a high frequency reference signal of said desired frequency from said oscillator means; and adjustment means coupled to said divider means, said adjustment means being adapted to selectively adjust the division ratio fo said divider means to thereby produce said predetermined low frequency signal when said oscillator means produces a high frequency reference signal which varies from said desired high frequency by m Hz.

3,978,650

ELECTRIC TIMEPIECE

Yukio Hashimoto, Niiza, and Shigeru Morokawa, Higashiyamato, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Oct. 23, 1974, Ser. No. 517,231

Claims priority, application Japan, Oct. 24, 1973, 48-119605

Int. Cl.² G04C *3/00;* H03F *1/00*

U.S. Cl. 58—23 AC 7 Claims

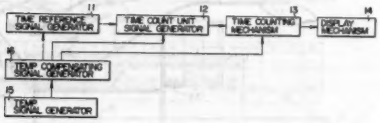
1. An electronic timepiece which is provided with a time reference signal having an output signal time count unit signal

generator, a time counting mechanism and a time display mechanism; the electronic timepiece further comprising:

a temperature signal generator for generating a temperature signal, said generator including an oscillator circuit having an output different from that of said time reference signal generator, wherein the ratio of output oscillation frequencies changes with temperature variation;

means for transmitting said temperature signal intermittently;

memory means for storing the temperature signal generated by said temperature generator until a subsequent temperature signal is generated and for delivering said stored temperature signal when the subsequent temperature signal is received by the memory;



a signal converter for generating a temperature compensating signal, wherein said compensating signal compensates for the variations of the output frequency of said time reference signal generator caused by temperature variations; and

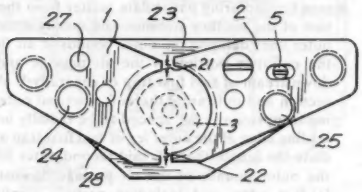
a time reference signal frequency variable controller for synthesizing the output signal of said time reference signal generator and that of said signal converter by compensating for the changes of the output frequency of said time reference signal generator caused by the temperature variations and for delivering a resultant signal to said time unit signal generator.

3,978,651

STEP MOTOR FOR QUARTZ CRYSTAL ELECTRONIC TIMEPIECE

Masahito Yoshino, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 27, 1974, Ser. No. 537,029
Int. Cl.² G04C *3/00*
U.S. Cl. 58—23 D **5 Claims**



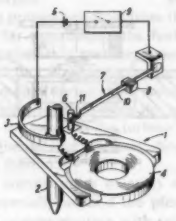
1. In a stepmotor for use in a quartz crystal electronic timepiece, the improvement comprising a reference member; a pair of stator yokes permanently mounted to said reference member and having ends to define the gap therebetween, at least a region of said reference member in registration with said gap being formed of a material of a magnetic permeability less than the permeability of said yokes to substantially magnetically isolate said yokes from each other; said reference member being mountable on a watch plate; and a permanent magnet rotor in said gap surrounded by said stator yokes.

3,978,652

FORMED CONTACT SPRING FOR ELECTRO-MECHANICAL WATCHES

Edward Kaulins, New Milford, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed June 19, 1975, Ser. No. 588,526
Int. Cl.² G04C *3/04*
U.S. Cl. 58—23 D **4 Claims**



1. In an electro-mechanical timekeeping device of the type having an oscillating balance wheel with an electric contact pin thereon and having means to effect driving impulses of said balance wheel repetitively as controlled by alternately striking a contact spring, the improvement in said contact spring comprising:

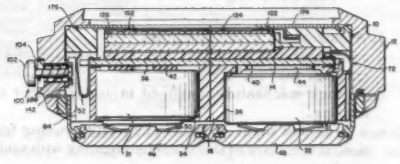
a straight contact spring member having a flat flexing portion adapted for orientation normal to the plane of oscillation of said balance wheel, said contact spring having a straight terminating end portion adapted for contact on opposite sides by said pin, said end portion being crimped so as to present opposite identical rigid contact surfaces of minimum surface area to said pin.

3,978,653

SOLDERLESS CONTACT FOR ELECTRONIC WATCH

Roger A. Burke, Laguna Beach, and Bela Somogyi, Costa Mesa, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed June 27, 1975, Ser. No. 591,219
Int. Cl.² G04C *3/00*; G04B *19/30*; H01R *11/22*
U.S. Cl. 58—23 R **7 Claims**



1. An electronic watch construction comprising:

a substrate having a face and having edges, said substrate carrying electronic watch components on the face thereof, at least one contact pad on said substrate adjacent the edge thereof, said contact pad being connected to said electronic circuitry;

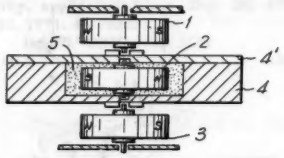
a contact spring having clamp jaws engaged over the edge of said substrate and clamping on said contact pad for electrical contact between said spring and said contact pad, said spring having a free end away from said jaws of said spring, said free end of said spring being contactable at case potential when said electronic watch structure is positioned in a watch case for connecting watchcase potential to said pad.

3,978,654

MOTION TRANSFORMER

Kenichi Koike, and Yoshikazu Kawamura, both of Shimosuwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Division of Ser. No. 477,239, June 7, 1974. This application Nov. 24, 1975, Ser. No. 634,803
Claims priority, application Japan, June 7, 1973, 48-64079
Int. Cl.[2] G04C *3/00*
U.S. Cl. 58—23 D 5 Claims



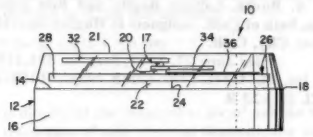
1. In an electronic timepiece having a step motor for intermittently stepping a gear train including a plurality of intermittently driven gears, the improvement comprising a first permanent magnet associated with at least one gear, said permanent magnet being intermittently rotated by said gear associated therewith, and clock hand means including a permanent magnet disposed to define a flux field between said gear associated magnet and said clock hand magnet, and viscous damping means surrounding said clock hand magnet to effect a continuous rotation of said clock hand means in response to the intermittent rotation of said gear train.

3,978,655

TIME CLOCK

Raymond McGillick, Kinnelon, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Aug. 4, 1975, Ser. No. 601,804
Int. Cl.[2] G04B *19/00*
U.S. Cl. 58—126 R 6 Claims



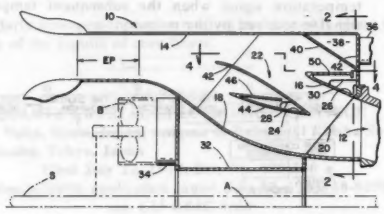
1. A time clock, which comprises:
a. a clock housing having an open front wall and an interior chamber therein;
b. a clock mechanism contained in said chamber of said housing;
c. a ternary of shafts arranged one within another for rotation, said ternary of shafts communicating with said clock mechanism;
d. a dial having a front face with points equidistantly spaced radially there around and a center aperture therethrough, said ternary of shafts extending through said center aperture of said dial;
e. a minute hand affixed to an outer free end of said longest shaft;
f. a second hand affixed to an outer free end of said shortest shaft;
g. an hour hand affixed to an outer free end of said intermediate shaft;
h. means for integrally joining said second hand to said front face of said dial, said dial rotating in union with said second hand; and
i. a transparent lens contained across said open front wall covering said dial.

3,978,656

GAS TURBINE ENGINE AIR INLETS HAVING PARTICLE SEPARATORS

Joseph P. Murphy, Newtown, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Feb. 20, 1975, Ser. No. 551,088
Int. Cl.[2] F02C *7/09, 7/00*
U.S. Cl. 60—39.09 P 12 Claims

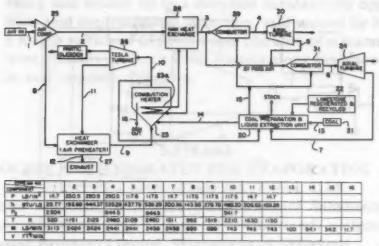


1. A gas turbine engine air inlet comprising:
inner and outer liner means defining an annular air passage which curves inward relative to the engine axis from an entrance portion toward the engine compressor entrance;
a plurality of hollow struts extending radially through the curved portion of the air flow passage;
means for capturing particulate matter from the inner portion of said annular passage, said means including a first trap of generally V-shaped cross section having inner and outer legs, the downstream end of each of said legs being joined to form an apex, said first trap being disposed in and generally aligned with the direction of air flow in the curved portion of the passage, said inner and outer legs of said first trap being concentric with the engine axis, said legs forming at the apex end portion thereof particle receiving pocket portions spanning adjacent struts, said pocket portions opening into the interiors of said struts, the upstream end of said inner leg being joined by an annular plate extending therefrom towards the inner surface of said outer leg, said plate being disposed at a low angle relative to the air flow direction and terminating in spaced relation to said outer leg to define a narrow entrance to the particle receiving pocket portions;
means for capturing particulate matter from the outer portion of the air flow streams, said means including a first outer liner defining the outer bounds of air flow through the entrance portion of the air passage and extending downstream of said first trap of generally V-shaped cross section and outwardly thereof, a second outer liner having its upstream edge spaced to be radially inward of the leading edge of the outer leg of said first trap and intermediate the length thereof, said second outer liner defining the outer bounds of the air passage downstream of its leading edge, and including particle receiving pocket portions, outwardly of the second outer liner, which span adjacent struts and open into the interiors thereof, a plate angled inwardly from the first outer liner towards the outer pocket portions, and a plate extending downstream from the leading edge of the second outer liner and terminating in closely spaced relation from said angled plate to define a relatively narrow entrance to the outer pocket portions,
the outer pocket portions and the plates defining the entrance thereto being concentric of the engine axis; and
means for maintaining a reduced pressure within the interior of said struts to draw particles thereinto from both of said particle collecting pocket portions.

3,978,657
TURBINE SYSTEM

Garland L. Fulton, Wayne, and David W. Taylor, Edgemont, both of Pa., assignors to Combustion Turbine Power, Inc., Doylestown, Pa.

Filed Feb. 6, 1974, Ser. No. 439,994
Int. Cl.[2] F02B *43/08, 43/00*
U.S. Cl. 60—39.12 11 Claims



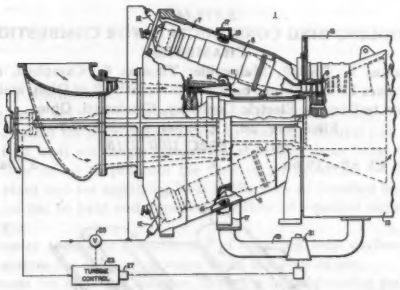
1. A turbine system comprising; a first turbine and means for heating operating gas for said first turbine including means for directly combustion heating said gas and means for indirectly combustion heating said gas

means for deriving the fuels for both said heating means from a common fuel, said deriving means comprising means for separating from the common fuel, volatile constituents, leaving residual solid matter; means for combusting said residual solid matter; and a disc-type turbine operated by the products of combustion from said residual solid matter combustion means.

3,978,658
VARIABLE LOAD GAS TURBINE

Sheila M. Forbes, Ancaster, and Arthur W. J. Upton, Hamilton, both of Canada, assignors to Westinghouse Canada Limited, Hamilton, Canada

Filed Mar. 21, 1972, Ser. No. 236,651
Int. Cl.[2] F02C *9/14, 9/04*
U.S. Cl. 60—39.27 3 Claims



1. A gas turbine unit operable to facilitate rapid changes in a load imposed on said turbine unit, said turbine unit comprising:

a compressor for pressurizing a fluid,

a plurality of combustion chambers disposed in annular array in which pressurized fluid is admixed with a fuel and burned to produce a high temperature motive fluid,

a plenum chamber encircling and in fluid communication with said combustion chambers and adapted to direct pressurized fluid from said compressor to said combustion chamber,

a turbine portion in fluid communication with said combustion chamber and adapted to convert energy in said high temperature motive fluid to rotating energy, said turbine portion being so connected to said load and to said compressor to drive said load and said compressor, and said compressor portion and said turbine portion being matched so that during normal operation generally the complete output of the compressor portion passes through the turbine portion,

an exhaust duct into which the motive fluid from the turbine portion is discharged,

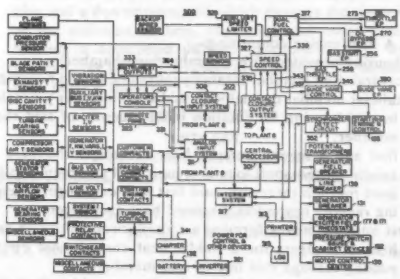
means for bleeding pressurized fluid from the plenum chamber and means for maintaining the fuel supplied to the combustion chamber at a predetermined flow rate, said bleed means and fuel flow maintaining means cooperating to negate flameout during rapid reduction in load and to maintain the temperature within the turbine portion at a generally high level so that the turbine unit can pick up load rapidly without large thermal shocks and stresses being produced therein,

said bleed means comprising a plurality of apertures disposed circumferentially around the plenum chamber, a conduit in fluid communication with said aperture, flow control means disposed in said conduit, and a header in fluid communication with said apertures and said conduit, said flow control means being responsive to the speed of the turbine and the power output of the turbine unit.

3,978,659
BUMPLESS TRANSFER IN SHIFTING CONTROL COMMAND BETWEEN THE PRIMARY AND BACKUP CONTROL SYSTEMS OF A GAS TURBINE POWER PLANT

Jack R. Smith, Pittsburgh, and Leonard H. Burrows, Gibsonia, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 19, 1975, Ser. No. 551,203
Int. Cl.[2] F02C *9/08*
U.S. Cl. 60—39.28 R 11 Claims



1. For a gas turbine power plant having a primary control system which develops a control signal output utilized to regulate fuel flow to the turbine and a plurality of signals for regulating predetermined plant elements, the plant including a plurality of sensors for indicating the status of predetermined plant parameters and operating status conditions, backup control apparatus comprising:

a. input means coupled to receive information from the plant sensors;

b. first means, coupled to said input means, for generating a control signal output independently of the functionally identical signal developed by the primary control system;

c. second means, coupled to said input means, for generating an equal plurality of signals for regulating the predetermined plant elements independently of the functionally identical signals developed by the primary control system;

d. means for comparing each of the functionally identical signals, coupled to said first and second means for generating, and for developing a tracking error signal in response to any difference between any one of said generated signals and the functionally identical signal developed by the primary control system; and

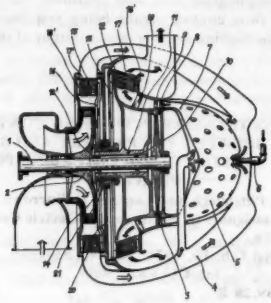
e. transfer enabling means, connected between the primary control system and the means for comparing, for preventing a shift in control command to said backup apparatus whenever said means for comparing develops said tracking error signal.

3,978,660

ROTARY HEAT EXCHANGERS IN THE FORM OF TURBINES

Nikolaus Laing, Hofener Weg 35-37, 7141 Aldingen near Stuttgart, Germany

Division of Ser. No. 84,097, Oct. 26, 1970, Pat. No. 3,811,495. This application Apr. 1, 1974, Ser. No. 457,131
Int. Cl.² F02C *7/08*
U.S. Cl. 60—39.51 R **4 Claims**



1. A heat engine comprising:

a housing provided with a combustion chamber;

a central shaft member rotatably journaled in said housing;

a tubular member coaxial with said shaft member journaled in said housing for rotation independently of said shaft member;

a first and a second annular heat exchanger mounted at axially spaced-apart locations on one of said members for joint rotation therewith, said first heat exchanger extending radially beyond said second heat exchanger;

first conduit means forming a closed circuit through said heat exchangers for a fluidic heat carrier, said circuit passing through said one of said members;

second conduit means for conducting a working fluid rich in ambient air in an open circuit through said housing via said second heat exchanger, said combustion chamber and said first heat exchanger;

fuel-inlet means in said combustion chamber for producing therein a combustible fuel/air mixture generating an expanding gas flow upon ignition thereof;

a turbine mounted on the other of said members between said combustion chamber and said first heat exchanger for rotary displacement by said expanding gas flow;

a compressor in said open circuit upstream of said second heat exchanger mounted on said other of said members for rotary entrainment by said turbine to drive said working fluid into said combustion chamber; and

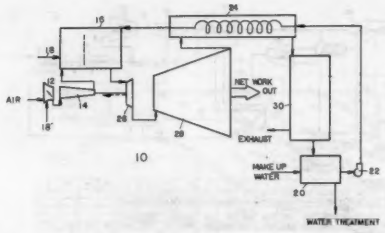
radial partition means rigid with said housing interposed between said first and second heat exchangers said partition means enabling close axial spacing of said heat exchangers.

3,978,661

PARALLEL-COMPOUND DUAL-FLUID HEAT ENGINE

Dah Yu Cheng, Palo Alto, Calif., assignor to International Power Technology, Palo Alto, Calif.

Filed Dec. 19, 1974, Ser. No. 534,479
Int. Cl.² F02C *7/10, 7/00*
U.S. Cl. 60—39.55 **12 Claims**



1. A heat engine comprising:

a. first means for converting heat energy to mechanical work essentially according to the Brayton thermodynamic cycle, having a first working fluid resulting from combustion of a mixture of air and a hydrocarbon fuel in the ratio of from about 0.8 to 2.0 times the stoichiometric air/fuel ratio;

b. second means for converting heat energy to mechanical work essentially according to the Rankine thermodynamic cycle, having a second working fluid comprising water;

c. said first and second means operating in parallel with each other with means for intermixing said first and second working fluids with a ratio of water-to-air by weight in the range of about 0.2 to 1.0 so that the work output of each is compounded and said second working fluid contains greater heat content than said first working fluid, and

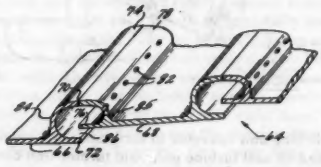
d. means for recuperating exhaust heat from said intermixed working fluid for pre-heating said second working fluid to the vapor or mixed liquid and vapor form prior to intermixing with the first working fluid.

3,978,662

COOLING RING CONSTRUCTION FOR COMBUSTION CHAMBERS

Thomas L. DuBell, Maineville; Thomas C. Campbell, and James L. Thompson, both of Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Apr. 28, 1975, Ser. No. 572,066
Int. Cl.² F02C *3/00, 7/18*
U.S. Cl. 60—39.65 **3 Claims**



1. An apparatus for passing a portion of a cooling fluid, flowing in a plenum in a predetermined direction, in a protective film upon a liner partially defining a hot gas passage, comprising:

a first liner segment partially defining the plenum;

a second liner segment partially defining the hot gas passage, the first and second liner segments cooperating to form a pocket;

a first lip at the downstream end of said second liner segment spaced from said first liner segment to form an exit from said pocket for directing cooling air along said first liner segment in said predetermined direction;

a second lip at the upstream end of said first liner segment, said second lip being radially spaced from said first lip and projecting into said pocket;

a plurality of apertures in said first liner adapted to pass cooling fluid in a plurality of streams into said pocket and along said second lip in a direction substantially opposite from said predetermined direction, said second lip having a length sufficient to permit said plurality of streams to at least partially coalesce while passing along said second lip in said opposite direction.

3,978,663

PROCESS AND APPARATUS FOR EVAPORATING AND HEATING LIQUIFIED NATURAL GAS

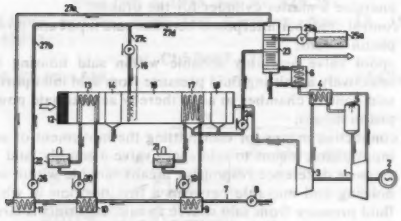
Charles Mandrin, Winterthur, and Mehmet Sahabettin Ergenc, Zollikerberg/ZH, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jan. 9, 1975, Ser. No. 539,653

Claims priority, application Switzerland, Jan. 11, 1974, 333/74

Int. Cl.² F02C *7/16, 7/12*

U.S. Cl. 60—39.67 **5 Claims**



1. In combination,

an open gas turbine plant for receiving a flow of air;

a conduit for conducting a flow of liquified natural gas;

a first heat exchange system for absorbing heat from the flow of air to pre-cool the flow of air upstream of said plant and for supplying heat to the flow of liquified natural gas to heat and vaporize the flow of liquified natural gas;

a water separator downstream of said first heat exchange system for separating water from the flow of air;

means for mixing a medium having a lower freezing point than water into the flow of air downstream of said heat exchange system;

a second heat exchange system in the path of flow of the air downstream of said mixing means for cooling the flow of air and for supplying heat to the flow of liquified natural gas;

a second water separator downstream of said second heat exchange system for separating a mixture of the medium and water from the flow of air; and

a rectification column connected to said second heat exchange system and said second water separator for receiving the mixture of medium and water to separate the water from the medium and to recover the medium.

3,978,664

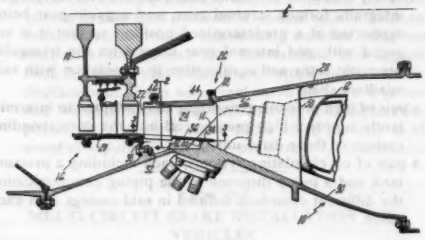
GAS TURBINE ENGINE DIFFUSER

Robert W. Parker, Tolland, and Bertus Ooms, Coventry, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 534,619, Dec. 20, 1974, abandoned. This application Sept. 29, 1975, Ser. No. 617,922

Int. Cl.² F02C *7/20*

U.S. Cl. 60—39.69 **9 Claims**



1. In a gas turbine engine having a compression section which includes a plurality of exit vanes circumferentially disposed within the path of working medium gases flowing from the compression section and having a diffusion section downstream of the compression section which includes an inner wall and an outer wall which are joined by a plurality of radially oriented struts extending between the inner and outer walls, apparatus for diffusing the working medium gases which flow from the compression section to the combustion section during operation of the engine, comprising:

an inner flow path shroud having an upstream end which is joined to the exit vanes of the compression section and a downstream end which is located radially outboard of and joined to the inner wall of the diffusion section; and

an outer flow path shroud having an upstream end which is attached to the exit guide vanes of the compression section and a downstream end which engages the outer wall of the diffusion section, the inner and outer shrouds forming a controlled diffuser upstream of said struts which is free of protuberances in at least the predominant axial portion thereof.

3,978,665

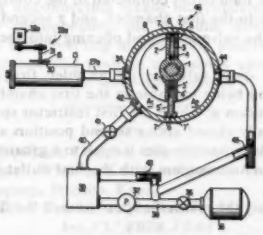
OIL HYDRAULIC MOTOR

Hideaki Yoshioka, No. 20-31, 4-chome, Suizenji, Kumamoto, Japan

Filed Jan. 31, 1975, Ser. No. 545,901

Int. Cl.² F15B *13/06*

U.S. Cl. 60—325 **4 Claims**



1. An oil hydraulic motor comprising:

a main shaft;

an auxiliary shaft disposed in line with and directly coupled to said main shaft;

a pair of rotary type drive units, each including a casing which has a built-in rotor, being connected respectively to the main shaft and the auxiliary shaft;

said rotor of the drive unit connected to the main shaft being disposed in the corresponding casing at an eccentric position and a pair of shield elements being arranged thereon at diametrically opposite positions;

said rotor of the drive unit for the auxiliary shaft having a nearly triangular prismatic configuration and carrying an integrally formed internal gear, and a guide gear being supported at a predetermined position so that it is engaged with said internal gear formed on the triangular prismatic rotor and is operative in association with said auxiliary shaft;

a pair of high pressure generating units adapted to intermittently supply a high pressure oil into the corresponding casings of these drive units; and

a pair of oil circulating systems, each including a pressure tank and a pump disposed in the piping communicating the different chambers defined in said casings with each other.

3,978,666

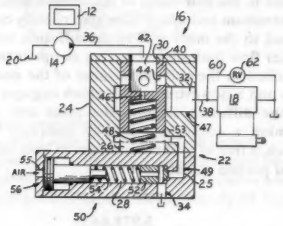
VEHICLE SPEED CONTROL APPARATUS AND METHOD

Kenneth W. Kelly, Warrensburg, and Wayne A. Peterson, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 11, 1975, Ser. No. 612,428

Int. Cl.² F15B *15/18*

U.S. Cl. 60—327 **7 Claims**



1. Apparatus for controlling the velocity of an engine driven vehicle having a control valve connected to a hydraulic system pump driven by said engine, comprising:

a valve body having first and second chambers, a fluid inlet connected to the pump and opening into the first chamber, a first fluid outlet connected to the control valve and opening into the first chamber, and a second fluid outlet through the valve body and opening into the first chamber;

a restrictor spool valve having an inlet, first and second outlets and being movable in the first chamber between a first position at which the first restrictor spool outlet is substantially closed and a second position at which the first restrictor spool outlet is open to a greater extent and in fluid communication with the first outlet of the valve body;

means biasing the restrictor spool toward the first position; and

means for controlling the passage of fluid through the second restrictor spool valve outlet and the second valve body outlet for further biasing the restrictor spool valve toward the first position.

3,978,667

HYDRAULIC BRAKE BOOSTER

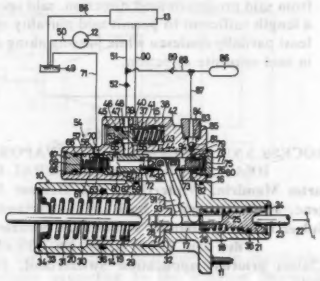
Naoki Ohara, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Toyota, Japan

Filed Sept. 24, 1975, Ser. No. 616,368

Claims priority, application Japan, Oct. 31, 1974, 49-124902

Int. Cl.² F15B *20/00, 1/02*

U.S. Cl. 60—403 **7 Claims**



1. A hydraulic brake booster having a source of continuously circulating fluid pressure comprising:

a housing having an inlet port and an outlet port;

input piston means slidable within said housing and operatively connected to a brake pedal;

power piston means slidable within said housing so as to energize a master cylinder for the brakes;

a control chamber interposed between said input and power piston means;

a spool valve assembly slidable within said housing for selectively admitting fluid pressure from said inlet port to said control chamber so as to thereby actuate said power piston means;

a connecting means for transmitting the movement of said input piston means to said spool valve assembly; and

a pressure difference responsive means slidable within said housing and movable between a first position in which fluid pressure from said source to said inlet port is circulated to said outlet port through a passage means formed within said pressure difference responsive means, and with respect to said spool valve assembly, and a second position in which the fluid pressure is set greater than the previous fluid pressure from said source after said passage means is blocked by the initial movement of said spool valve assembly,

whereby said greater fluid pressure is transmitted to said control chamber as a result of further movement of said spool valve assembly.

3,978,668

HYDRAULIC TRANSMISSION WITH INPUT-OUTPUT SPEED RATIO REGULATION

Gerhard Nonnenmacher, Korntal, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Oct. 10, 1972, Ser. No. 621,633

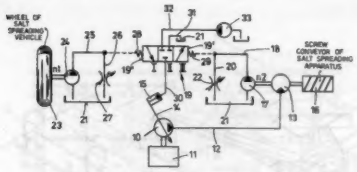
Claims priority, application Germany, Oct. 29, 1974, 2451293

Int. Cl.² F16H *39/46*

U.S. Cl. 60—447 **16 Claims**

1. An hydraulic transmission arrangement for driving a dispensing apparatus at a speed varying in proportion to a command value furnished by a command means, comprising, in combination, a hydromotor for driving the dispensing apparatus; an adjustable-output main pump fluidly connected to the hydromotor for driving the same by supplying pressurized fluid thereto; regulating means for automatically varying the rotary speed of the hydromotor in proportion to variations in

the command value furnished by the command means, including first and second measuring pumps connected to and driven by the hydromotor and the command means, respectively, for generating first and second control pressures respectively dependent upon the rotary speed of the hydromotor and the command value furnished by the command means, hydraulic control means connected to the fluid outputs of the measuring



pumps and connected to the adjustable-output main pump for automatically adjusting the output of the main pump in dependence upon the difference between the first and second control pressures, and first and second flow restricting means each leading from the fluid output of a respective measuring pump to an unpressurized space for partially relieving the control pressure generated by the respective measuring pump.

3,978,669

SERVO-POWER-ASSISTED HYDRAULIC BRAKE-ACTUATING ARRANGEMENT

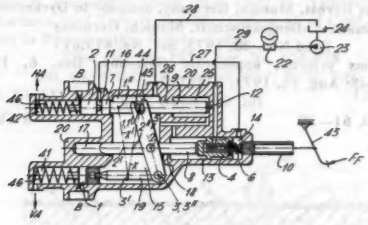
Juan Belart, Walldorf, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Oct. 3, 1975, Ser. No. 619,281

Claims priority, application Germany, Nov. 12, 1974, 2453573

Int. Cl.² B60T *13/20*

U.S. Cl. 60—549 **15 Claims**



1. A servo-power-assisted hydraulic brake-actuating arrangement comprising:

a housing;

a first bore disposed in a given plane within said housing having a first axis;

a second bore disposed in said given plane within said housing having a second axis parallel with said first axis;

a third bore disposed in said given plane within said housing having a third axis parallel with said first and second axes;

a source of servo pressure;

a first displacement piston disposed in said first bore coaxial of said first axis to actuate a first brake circuit;

a second displacement piston disposed in said second bore coaxial of said second axis to actuate a second brake circuit;

an ancillary piston disposed in said second bore coaxial of said second axis and in tandem relation with said second displacement piston, said ancillary piston and said second displacement piston being interconnected and forming in said second bore a first chamber;

a tappet disposed coaxial of said second axis connected to said ancillary piston remote from said second displacement piston and extending in its end position to a housing stop remote from said second displacement piston;

a brake valve disposed in said third bore coaxial of said third axis, said brake valve being connected to said source and a brake pedal to couple said servo pressure to said first chamber for actuation of said second displacement piston when said brake pedal is actuated;

a balance arm disposed in said housing pivotably connected at opposite ends thereof to said first displacement piston and said tappet; and

a force transmitting member disposed in said third bore coaxial of said third axis and in tandem relation with said brake valve, said force transmitting member being connected to said balance arm intermediate said opposite ends to actuate said balance arm with actuates said first displacement piston when said servo pressure is present and which actuates said first and second displacement pistons by a driver's brake pedal effort directly in the event of failure of said servo pressure.

3,978,670

MULTI-CIRCUIT BRAKE INSTALLATION FOR VEHICLES

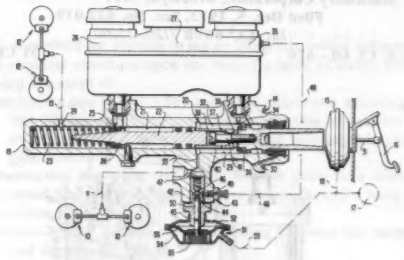
Werner Kruse, Schornbach, and Reinhard Resch, Stuttgart, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Oct. 17, 1975, Ser. No. 623,253

Claims priority, application Germany, Oct. 24, 1974, 2450474

Int. Cl.² F15B *7/00*

U.S. Cl. 60—562 **27 Claims**



1. A multi-circuit brake installation for vehicles in which at least two transmitter piston means having differently large effective brake pressure piston areas and operatively connected with each other by a hydraulic drive connection means, operate within a master brake cylinder means actuatable at will by a servo-assist means, and in which the transmitter brake piston means are operatively connected with a respective brake circuit and are provided with means for limiting the relative movement with respect to one another, characterized by disconnecting means independent of the brake circuits for disconnecting the hydaulic drive connection means, said disconnecting means being positively displaced into the disconnecting position exclusively upon occurrence of a critical value of the servo-assist means.

3,978,671

DUPLEX ENGINE OIL SEPARATOR

Cesar Gonzalez, Wichita, Kans., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed Oct. 15, 1974, Ser. No. 514,764

Int. Cl.² F02B *33/44*

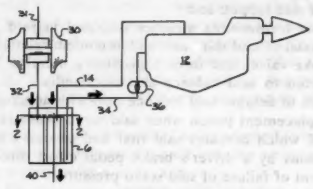
U.S. Cl. 60—598 **5 Claims**

1. A duplex air-oil separator for separating two air-oil mixtures of differing proportions from and engine crankcase vent and a turbo-charger oil drain comprising:

a housing;

a first perforated partition wall located within the housing defining first and second separator chambers each having upper portions and sumps at the bottom thereof;

a first conduit means from the engine crankcase vent communicating with the first separator chamber to transmit the air-oil mixtures high in air to the first chamber for



separation, a second conduit means from the turbocharger oil drain communicating with the second separator chamber to transmit air-oil mixtures low in air to the second chamber for separation, an exhaust vent conduit communicating the upper portion of the second chamber to atmosphere, and a sump drain conduit connected to the sump area of the second chamber.

3,978,672

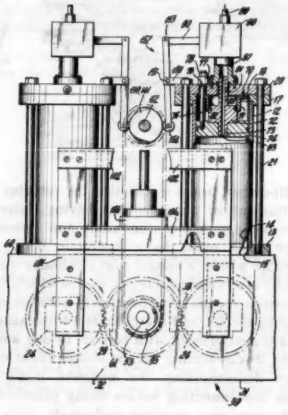
GAS OPERATED ENGINE

Joseph D. Stenger, Brooklyn, N.Y., assignor to Propulsion Machinery Corporation, Brooklyn, N.Y.

Filed Dec. 5, 1973, Ser. No. 422,019

Int. Cl.² F01B 7/20, 25/00

U.S. Cl. 60—670 **31 Claims**



1. An engine comprising a cylinder, a main piston slidable in said cylinder, a head fixed to the top of said cylinder, an auxiliary piston slidable in said cylinder, above said main piston and below said head, pressure actuated means to slidably move said main piston in said cylinder, and pressure actuated means to slidably move said auxiliary piston in said cylinder, a crankshaft, and connecting rod means to connect said crankshaft to said main piston for rotating said crankshaft as said main piston moves in said cylinder, means to actuate said means to slidably move said main piston, in sequence with rotation of said crankshaft, and means to actuate said means to slidably move said auxiliary piston, in sequence with the rotation of said crankshaft.

3,978,673

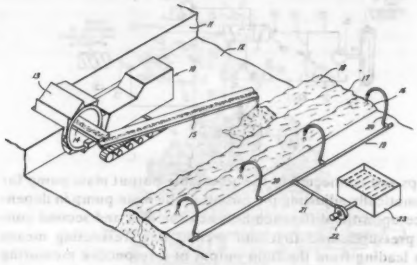
METHOD OF DISPOSING OF LIQUID WASTE

Stephen C. Schleede, Hinsdale, Ill., assignor to A & H Engineering Corporation, Hinsdale, Ill.

Filed Apr. 21, 1975, Ser. No. 569,694

Int. Cl.² E02D 3/10

U.S. Cl. 61—35 **4 Claims**



1. The method is disposing of a pumpable liquid waste comprising the steps of continuously and simultaneously (i) excavating earth to a depth of at least six feet from one region and (ii) transporting it to and depositing it at another region, and depositing liquid waste on the excavated earth after it has been deposited at said another region and while the porosity thereof is greater than that of the earth prior to excavation.

3,978,674

DEVICE FOR THE DISCHARGE OF COMPRESSION MATERIAL IN THE PRODUCTION OF THE COMPRESSION MEMBER OF A PULL AND PRESSURE ANCHOR

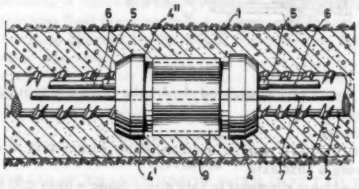
Thomas Herbst, Munich, Germany, assignor to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Germany

Filed Nov. 28, 1973, Ser. No. 419,617

Claims priority, application Germany, Dec. 6, 1972, 2259648; Aug. 16, 1973, 2341279

Int. Cl.² E02D 5/00

U.S. Cl. 61—39 **8 Claims**



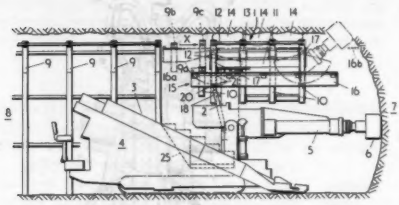
1. An anchoring device adapted to hold one end of a to-be-stressed linear member within the bore hole of an earth formation of the type which surrounds the buried end portion of the stressed linear member and comprises distribution means for feeding hardenable material under pressure to the regions outside the device to compress the earth surrounding the bore hole, comprising a tubular body constructed to surround and retain a section of the linear member, at least one compression channel extending along the circumferential portion of said body, means for feeding hardenable material to the compression channel, said compression channel being open to the outside of the tubular body through a substantial part of its intermediate length to form a distribution channel, and a sleeve of elastic material encompassing said body to normally cover the open part of said distribution channel.

3,978,675

MINE ROOF SUPPORT EQUIPMENT

Philip Peter Jenkins, Cannock, and Stanley Lewis, Tickhill, both of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Jan. 29, 1974, Ser. No. 437,707
Int. Cl.[2] E01G *3/00*
U.S. Cl. 61—45 F **5 Claims**



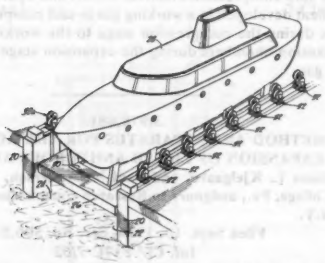
1. Mine roof support equipment comprising a canopy, at least one upright member for supporting the canopy, and at least one inflatable, deformable member supported by the canopy, the canopy comprising a framework of parallel beams, spacer means interconnecting the parallel beams and constituting a deck supporting the inflatable, deformable member, a platform pivotally supported by links connected to the beams and rams connected to the platform and to the upright member for swinging and lifting the platform forward and rearward with respect to the movable base.

3,978,676

SHIP LIFTING APPARATUS

Henry B. Chambers, Santa Inez; Clair W. Tellefson, Santa Barbara, and Tony H. Balsillie, Goleta, all of Calif., assignors to Hydranautics, Goleta, Calif.

Filed Oct. 28, 1975, Ser. No. 626,078
Int. Cl.[2] E02C *5/00;* **B66B** *9/04;* **B63C** *5/00*
U.S. Cl. 61—65 **12 Claims**



1. Ship lifting apparatus comprising a pair of parallel, spaced apart piers defining a slip, a platform in said slip adapted to support a vessel, and means attached to said piers for raising and lowering said platform; in which the improvement comprises:

a. a plurality of chain jacks mounted in an aligned row on each of said piers and having the ends of their raising and lowering chains attached to said platform;

b. said chain jacks each having a base and a hydraulic cylinder for moving a ram repetitively and reciprocally with respect to said base, and having latches operatively attached to said base and to said ram for engaging and disengaging links of said chains;

c. one of said jacks having means for controlling operation of said latches of said jack at predetermined relative positions of its ram and its base;

d. stressed cables for connecting the latches of said one of said jacks with the latches of the others of said jacks, whereby said one of said jacks becomes a master jack and the others of said jacks become slave jacks; and,

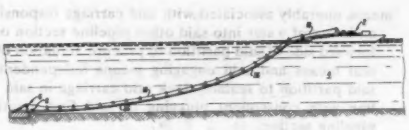
e. means for simultaneously introducing pressurized fluid into the hydraulic cylinders of said jacks to cause simultaneous reciprocal movement of the rams of said jacks with respect to their bases and means for actuating said tensioned cables thereby to produce simultaneous operation of said latches resulting in progressive raising and lowering of the chains of said jacks and corresponding raising and lowering of said ship supporting platform.

3,978,677

METHOD OF STARTING AND LAYING SUBMERGIBLE ELONGATE STRUCTURES

Joe C. Lochridge, 518 Winter Oaks Dr., Houston, Tex. 77024

Filed Mar. 2, 1972, Ser. No. 231,201
Int. Cl. F16l *1/00;* **B65g** *9/00*
U.S. Cl. 61—72.3 **14 Claims**



1. A method for starting to lay an integrally united submergible elongate structure upon the bed of a body of water, comprising the steps of:

anchoring one end of a flexible cable adjacent a submerged installation, said installation being operable to connect to an initial end of the integrally united submergible elongate structure to be laid;

connecting the other end of the flexible cable to a marine vessel buoyantly supported upon the surface of a body of water;

tensioning the flexible cable extending between the anchor and the marine vessel;

progressively suspending and lowering sequential portions of the integrally united submergible elongate structure from the tensioned cable at a station upon the marine vessel;

slidably supporting from the flexible cable the integrally united submergible elongate structure between the marine vessel and the bed of the body of water; and

maintaining a profile control over the integrally united submergible elongate structure between the marine vessel and the bed of the body of water.

3,978,678

METHOD AND APPARATUS FOR PLUGGING A PIPELINE

Anthony B. Duncan, Missouri City, and Arthur H. T. Chin, Houston, both of Tex., assignors to HydroTech International, Inc., Houston, Tex.

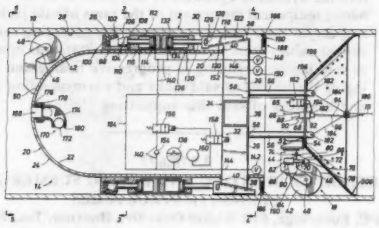
Filed Oct. 14, 1975, Ser. No. 622,038
Int. Cl.[2] F16L *1/04;* **B63B** *35/04*
U.S. Cl. 61—112 **17 Claims**

1. Apparatus for plugging a dry section of a pipeline in response to an influx of water into another section thereof while the pipeline is being laid on a sea bottom comprising;

a carriage disposable in said pipeline and including a partition having forward and rearward sides with said forward side being exposable to water which may enter said other pipeline section;

means operably associated with said carriage for effecting a seal between the internal wall of said pipeline and said carriage;

means operably associated with said carriage for disengageably engaging the internal wall of said pipeline to lock said carriage against movement relative thereto, and



means operably associated with said carriage responsive to an influx of water into said other pipeline section on the forward side of said partition to procure actuation of said seal means and said engaging means independently of said partition to sealably lock said carriage in said pipeline with consequent plugging of said first mentioned pipeline section.

3,978,679

METHOD AND APPARATUS FOR UNDERWATER TRENCH EXCAVATION AND PIPELINE LAYING

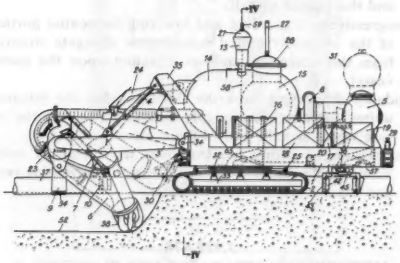
Claude F. Lecomte, Prairie au Duc, 44040 Nates, France

Filed Jan. 22, 1975, Ser. No. 543,105

Claims priority, application France, Jan. 22, 1974, 74.02077

Int. Cl.[2] E02F *5/06;* **F16L** *1/00*

U.S. Cl. 61—72.4 **23 Claims**



1. In a method of underwater excavation for entrenchment of a pipeline including laying a pipeline to be entrenched on the sea bed and subsequently digging the trench for the pipeline wherein the improvement comprises the steps of: digging the trench by a single lateral excavation of the seabed immediately beneath the pipeline using a tractory excavation machine, said machine positioned laterally from and contacting the pipeline and said trench is excavated on the same lateral side of the pipeline as said machine is positioned.

3,978,680

HEAT ENGINE

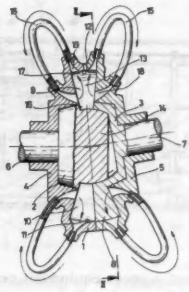
Jürgen Schukey, Borgfelde 16, 2000 Hamburg-Schenefeld, Germany

Filed Dec. 5, 1974, Ser. No. 530,010

Claims priority, application Germany, Dec. 6, 1973, 2360865

Int. Cl.[2] F25B *9/02;* **F25D** *9/00;* **F01B** *29/10;* **F02G** *1/04*

U.S. Cl. 62—6 **6 Claims**



1. A heat engine which includes: housing means comprising a first section and a second section connected to each other, a first rotor and a second rotor respectively rotatably journaled in said first and second housing sections so that the extension of their axes intersect at an obtuse angle, the periphery of said rotors being provided with displacement bodies arranged in such a manner that the displacement bodies of one rotor in the manner of interengaging teeth extends between two displacement bodies of the other rotor, said displacement bodies together with said housing means forming compression chamber means adapted to receive a working gas and successively decreasing from a maximum volume to a minimum volume and also forming expansion chamber means successively increasing in volume from said minimum volume to said maximum volume for compressing and expanding a working gas so as to pass said working gas through the phases of a thermodynamic cycle, and heat exchanger means associated with said compression chamber means and operable to transfer heat developed in a working gas in said compression chambers during the compression stage to the working gas in the expansion chambers during the expansion stage of the working gas.

3,978,681

METHOD AND APPARATUS FOR THE ADIABATIC EXPANSION OF LIQUID ANHYDROUS AMMONIA

William L. Kjelgaard, and Paul M. Anderson, both of State College, Pa., assignors to Research Corporation, New York, N.Y.

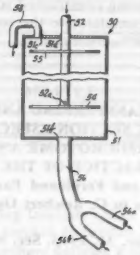
Filed Sept. 16, 1974, Ser. No. 506,516

Int. Cl.[2] F17C *7/02*

U.S. Cl. 62—51 **4 Claims**

1. A expansion chamber useful for the substantially adiabatic expansion of ambient-temperature, pressurized anhydrous liquid ammonia to produce separate streams of cold ambient or atmospheric pressure gaseous anhydrous ammonia and liquid anhydrous ammonia comprising a closed expansion chamber provided with two outlets, one outlet being useful for the withdrawal of cold gaseous anhydrous ammonia and the other outlet being useful for the withdrawal of cold anhydrous liquid ammonia, said outlet for the withdrawal of gaseous ammonia being located at one end of said chamber and said other outlet for the withdrawal of liquid ammonia being positioned at the other end of said chamber, conduit means associated with said expansion chamber for introducing thereinto

a stream of ambient-temperature, pressurized liquid anhydrous ammonia for expansion therein to produce cold gaseous ammonia and cold liquid ammonia at substantially ambient or atmospheric pressure, said conduit means for the introduction of said stream of ambient-temperature, pressurized liquid ammonia into said expansion chamber being provided with an outlet, said outlet being positioned intermediate said gaseous ammonia and said liquid ammonia outlets, a first baffle plate fixed to said conduit means below said outlet provided by said



conduit means, said first baffle plate providing a first annular space between the periphery thereof and the inside of said expansion chamber and a second baffle plate fixed to said conduit means, said second baffle plate providing a second annular space between the periphery thereof and the inside of said expansion chamber and being fixed to said conduit means and located within said expansion chamber intermediate the outlet for gaseous ammonia and said outlet provided by said conduit means.

3,978,682

REFRIGERATION METHOD AND APPARATUS BY CONVERTING ^{4}HE TO A SUPERFLUID

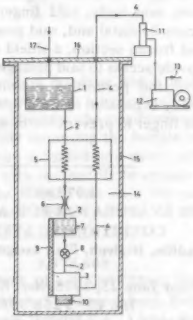
Adrianus Petrus Severijns, and Frans Adrianus Staas, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 21, 1975, Ser. No. 551,636

Claims priority, application Netherlands, Mar. 1, 1974, 7402781

Int. Cl.^{2} F25B *41/00*

U.S. Cl. 62—113 **7 Claims**



1. In a refrigerator operable at temperatures below the λ-point of helium, including a reservoir for containing liquid ^{4}He I, a heat exchanger for further cooling said liquid ^{4}He I, a choke member with inlet and outlet means for reducing the pressure of said further cooled liquid, an evaporation chamber for converting at least part of said further cooled ^{4}He I to superfluid ^{4}He II at a temperature below the λ-point thereof, and duct means for flowing said helium sequentially through said elements, the improvement in combination therewith comprising an auxiliary reservoir intermediate said choke member outlet and said evaporation chamber, and a highly heat-conductive element interconnecting and forming a heat-conductive assembly of said evaporation chamber and said auxiliary reservoir, whereby liquid ^{4}He in said auxiliary reservoir is cooled to below the λ-point by ^{4}He II in the evaporation chamber, and the choke inlet and outlet means are at substantially the same temperature, for preventing flow-back of said ^{4}He II from said evaporation chamber to said auxiliary reservoir.

3,978,683

ABSORPTION REFRIGERATOR OF NATURAL CIRCULATION TYPE

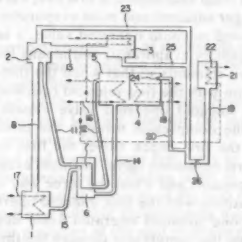
Satoshi Naito, Kosai, Japan, assignor to Yazaki Sogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 4, 1975, Ser. No. 610,177

Claims priority, application Japan, Sept. 19, 1974, 49-107152

Int. Cl.^{2} F25B *41/00*

U.S. Cl. 62—174 **2 Claims**



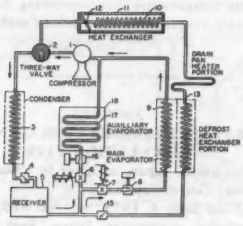
1. An absorption refrigerator of natural circulation type employing water as a refrigerant and lithium salt as an absorbing medium, comprising a generator for heating to boil a dilute lithium salt solution, a separator for separating water vapor expelled in said generator from the concentrated lithium salt solution, a condenser for condensing the water vapor separated in said separator, an evaporator for vaporizing the water or refrigerant condensed in said condenser by heat exchange with another fluid, an absorber for reintroducing the water vapor generated in said evaporator into said separated concentrated lithium salt solution thereby diluting said concentrated lithium salt solution, and a U-tube disposed in the conduit portion between said condenser and said evaporator, said U-tube being connected at one end thereof to said conduit portion and at the other end thereof to a refrigerant reservoir, wherein the improvement comprises a cooling conduit extending into said refrigerant reservoir for maintaining substantially constant the internal pressure of said refrigerant reservoir so as to control the amount of the refrigerant stored in said refrigerant reservoir depending on the pressure differential across said U-tube, whereby the concentration of said lithium salt solution circulating through the refrigeration system can be controlled depending on the temperature of the heating medium supplied to said generator so as to compensate for variations of the refrigerating capacity due to variations of the heating temperature.

3,978,684

REFRIGERATION SYSTEM

David H. Taylor, Bloomington, Minn., assignor to Thermo King Corporation, Bloomington, Minn.

Filed Apr. 17, 1975, Ser. No. 569,035
Int. Cl.[2] F25B *13/00*; F25D *17/06*
U.S. Cl. 62—324 8 Claims



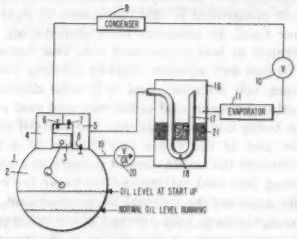
1. In a system for refrigeration, heating and defrosting, comprising a compressor, a three way valve, a condenser, a first check valve, a first solenoid operated valve, a first expansion valve, a main evaporator, a first heat exchanger, a second heat exchanger adjacent said main evaporator, a second check valve, a second solenoid operated valve, a second expansion valve, an auxiliary evaporator, and means for connecting the above named elements so that when the three way valve is in a first position with the first solenoid operated valve open and the second solenoid operated valve closed, refrigerant will flow from the compressor through the three way valve, the condenser, the first check valve, the first solenoid operated valve, the first expansion valve, the main evaporator, and back to the compressor, and when the three way valve is moved to a second position with the first solenoid operated valve closed and the second solenoid operated valve opened, refrigerant will flow from the compressor through the three way valve, the first heat exchanger, the second heat exchanger, the second check valve, the second solenoid operated valve, the second expansion valve, the auxiliary evaporator and back to the compressor; and adjustable means surrounding the first heat exchanger to control the amount of heat of compression dissipated by the first heat exchanger.

3,978,685

MEANS FOR TRAPPING OIL LOST DURING STARTUP OF REFRIGERANT COMPRESSORS

David H. Taylor, Minneapolis, Minn., assignor to Thermo King Corporation, Bloomington, Minn.

Filed July 14, 1975, Ser. No. 595,983
Int. Cl.[2] F25B *43/02*
U.S. Cl. 62—471 5 Claims



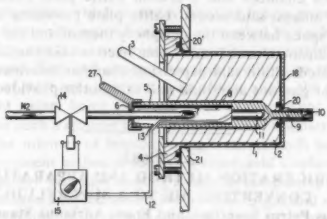
1. In a refrigeration system, a compressor comprising a crankcase, a reciprocating piston, a compression cavity, and a suction cavity, and leading from said compression cavity a circuit including in series, a condenser, an expansion device, an evaporator, an accumulator, and a connection to the suction cavity, the refrigeration system containing a refrigerant and oil for lubricating the compressor that form a reservoir of oil liquid refrigerant entrained therein during shutdown of the compressor, a conduit for venting foam from the crankcase to the accumulator, said conduit extending to the accumulator from a point on the crankcase that is above the level of the reservoir of oil refrigerant mixture at startup, said conduit having a check valve therein that permits flow only from the crankcase to the accumulator, the accumulator and return to the suction cavity being constructed so the refrigerant vapor drawn from the accumulator to the suction cavity will carry droplets of oil to the suction cavity.

3,978,686

PROCESS FOR TRANSFERRING AND/OR HANDLING OF A COLD TISSUE SECTION ESPECIALLY OBTAINED FROM AN ULTRAMICROTOME AND ARRANGEMENTS FOR PRACTICE OF THE PROCESS

Günther Lechner, and Ferdinand Pauliny, both of Vienna, Austria, assignors to C. Reichert Optische Werke AG, Vienna, Austria

Filed Mar. 31, 1975, Ser. No. 565,988
Claims priority, application Austria, Mar. 29, 1974, 2653/74
Int. Cl.[2] F25B *19/00*
U.S. Cl. 62—514 R 6 Claims



1. Apparatus for transferring a frozen section from a microtome without an increase in temperature deleterious to the section which comprises, a body having an expansion chamber, a source of compressed fluid operably connected to said expansion chamber to cool said body, a heat conductive finger extending from said body, said finger having a transverse passage adjacent its distal end, said passage having a support to receive said frozen section, a shield adapted to selectively cover and provide access to said passage for placing the frozen section therein and permitting examination of said frozen section, whereby expansion or fluid in said chamber removes heat from said finger to prevent warming of the section during the transfer.

3,978,687

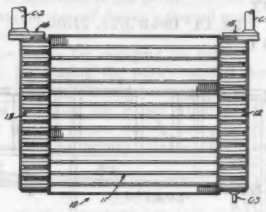
MODIFIED EVAPORATOR FOR AUTOMOBILE AIR CONDITIONING SYSTEMS

Elio A. Calzadilla, Hialeah, Fla., assignor to Faaca Inc., Hialeah, Fla.

Filed June 23, 1975, Ser. No. 589,379
Int. Cl.[2] F25B *39/02*
U.S. Cl. 62—525 4 Claims

1. In an automobile air conditioning evaporator having a rectangular heat exchange core, a refrigerant passage vacuum chamber communicating with and extending along one side of the core, a relatively parallel refrigerant passage pressure chamber communicating with and extending along the other side of the core, and a refrigerant conduit connector opening at corresponding ends of each of the core vacuum and pressure chambers; the modifications comprising, a pair of spaced, parallel plate members fixed with respect to and extending

perpendicularly outwardly of one of said vacuum and pressure chambers at the connector opening end thereof, a side wall member perpendicularly interconnecting said plate members and defining therebetween a chamber for the through flow of refrigerant, one of said plate members having a through opening in communication with its associated refrigerant conduit connector opening, the other of said plate members having a



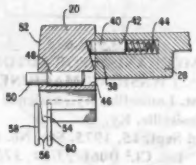
refrigerant flow opening laterally offset with respect to said associated refrigerant conduit connector opening, the spacing between said plate members defining a shallow chamber having a dimension less than the diameter of the associated refrigerant conduit connector opening but of sufficient dimension to provide for the free flow of both liquid and gaseous refrigerant therethrough (a fraction of the diameter of said associated refrigerant conduit connector opening).

3,978,688

FOLDING HANDLES FOR THE CARRIAGE OF A FLAT BED KNITTING MACHINE

Howard David Rogers, Fanwood, N.J., assignor to The Singer Company, New York, N.Y.

Filed Mar. 26, 1976, Ser. No. 670,793
Int. Cl.² D04B *7/00*
U.S. Cl. 66—60 **8 Claims**



1. In a flat bed knitting machine which includes a needle bed with sinkers along the outer longitudinal edge thereof and a carraige slidable on the bed, the combination comprising a handle, means pivotally mounting the handle on the carriage for movement between a folded and more upright position, and means movable with the handle to engage sinkers in the folded position of the handle and hold the carriage against longitudinal motion in a defined position on the needle bed.

3,978,689

NEEDLE BED FOR FLAT KNITTING MACHINES

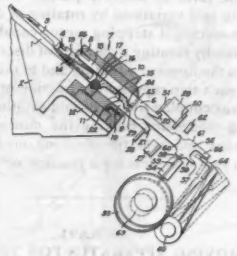
Marcel A. Vandermeirsch, St. Amandsberg, Belgium, assignor to Fabrique Nationale Herstal S.A., Liege, Belgium

Filed Apr. 22, 1975, Ser. No. 570,365
Claims priority, application France, May 14, 1974, 74.16669; Dec. 24, 1974, 74.42703
Int. Cl.² D04B *7/00*
U.S. Cl. 66—75 R **14 Claims**

1. Improved needle bed for flat knitting machines of the type having needles with heels which may be sunk within the bed, which comprises, for each needle being sunk, an oscillating lever, one bifurcated end of which receives the tail of the associated needle, while the other end is subjected to the action of a control member which may be reciprocated through the intermediary of selecting means;

all said oscillating levers being mounted on a common axis;

the bifurcated end of each oscillating lever consisting of two legs which are initially converging and are then parallel near the free ends thereof, the distance separating the parallel portions being very slightly greater than the height of the tail of the associated needle so that the said parallel portions clamp the said tail when the needle is in sunk position;



the control member comprising, at the needle side, two legs having unequal lengths and, on the other side, a tail having two opposite heels;

the facing edges of the said selector legs being profiled to form a control and locking cam for the said tail of the associated oscillating lever;

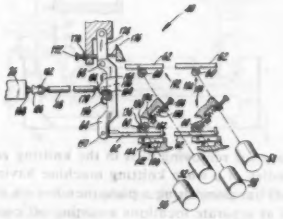
the said control and locking cam functions to bring and to maintain the associated oscillating lever in any of three predetermined angular positions of the said control member as a result of a suitable reciprocating movement, said three angular positions of the said oscillating lever corresponding respectively to a high position, a low position and a sunk position of the heel of the associated needle.

3,978,690

SELECTIVE POSITIONING SYSTEM PARTICULARLY FOR CONTROLLING GUIDE BARS OF KNITTING MACHINES

Thomas E. Beling, Saxonville; John O. Morin, Bedford, and Florian F. Yanikoski, Braintree, all of Mass., assignors to SIGMA Instruments, Inc., Braintree, Mass.

Continuation of Ser. No. 335,811, Feb. 26, 1973. This application Jan. 15, 1975, Ser. No. 541,091
Int. Cl.² D04B *23/00, 27/00*
U.S. Cl. 66—205 **49 Claims**



1. An apparatus for controlling one of a plurality of guide bars of a knitting machine in synchronism with at least one moving portion of the knitting machine so as to establish the characteristics of a knitting pattern, comprising: electrical signal producing means coupled to the portion of the machine for producing electrical signals which are in synchronism with

the portion and which define a characteristic of the knitted pattern, electrical rotating means coupled to the signal-producing means for responding to the signals and producing rotary motion corresponding to the signals in the forward and backward directions, transforming means coupled to said rotating means for transforming the rotary motion to corresponding translatory motion for coupling the translatory motion to the pattern bar so that the pattern bar follows a path prescribed by the signals, said electrical signal-producing means including stored program means and pulse-forming means responsive to the program means for producing the signals in the form of discrete pulses, said rotating means responding to said variations by rotating in discrete steps and including an electrical stepping motor capable of responding to pulse signals by rotating a plurality of discrete steps for each revolution in the forward direction and in the backward direction so that each step represents a fraction of a revolution, and braking means coupled to one of said rotating means and said transforming means for braking the motion of one of said rotating means and said transforming means at least once during each step representing a fraction of a revolution.

3,978,691

DUST REMOVING APPARATUS FOR THE NEEDLES OF A WARP KNITTING MACHINE

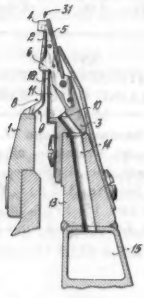
Reinhold Schmid, Rheydt, Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Germany

Filed Nov. 19, 1973, Ser. No. 417,378

Claims priority, application Germany, Nov. 18, 1972, 2256729

Int. Cl.[2] D04B *35/32*

U.S. Cl. 66—168 **5 Claims**



1. Means for removing dust in the knitting zone and at the latch needles of a warp knitting machine having at least one casting off bar comprising a plate member on which there are mounted at separate locations a casting off comb plate and a contoured stripping plate with a protruding portion of said stripping plate extending through the spaces between the latch needles, whereby the relative vertical motion between said plate member and said latch needles results in waste being stripped away from the shanks of the needles by said protruding portion, and means for directing a stream of cleaning air to extend across said latch needles and in an upward direction to at least the latches of said latch needles.

3,978,692

CARPET PRINTING APPARATUS

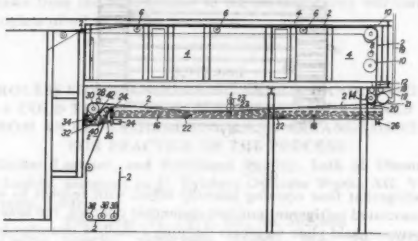
Trevor Hatfield Metcalfe; Geoffrey Scott, both of Bradford; Paul Michael Thompson, Pudsey, near Leeds, and Ernest Willford, Crossflats, near Keighley, all of England, assignors to Associated Weavers Limited, Bradford, England

Filed Mar. 27, 1974, Ser. No. 455,432

Claims priority, application United Kingdom, Mar. 30, 1973, 15586/73

Int. Cl.[2] D06B *3/22, 21/00*

U.S. Cl. 68—5 D **5 Claims**



1. Apparatus for treating a printed carpet having a pile on one surface only comprising:

a steamer through which said carpet may be fed in a single, generally horizontal pass, means for feeding said carpet through said steamer with said one surface uppermost;

said steamer further having an outlet through which said carpet leaves the steamer, wherein there is further provided;

a liquid bath adjacent said steamer outlet and means for conveying said carpet generally horizontally across said bath including means for floating said carpet on said liquid with said one surface lowermost as said carpet is conveyed across said bath.

3,978,693

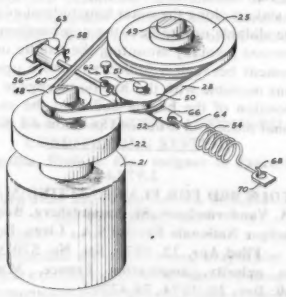
BELT DRIVE MECHANISM FOR AUTOMATIC CLOTHES WASHING MACHINE

Joseph C. Worst, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Sept. 15, 1975, Ser. No. 613,264

Int. Cl.[2] D06F *23/04, 37/38*

U.S. Cl. 68—12 R **10 Claims**



1. A belt drive mechanism for an automatic clothes washing machine having a timer to control the operational cycles of the machine, a basket supported for rotation, and a vaned structure for agitating the clothes in the basket, comprising:

a. a motor having a start winding and a run winding and providing a plurality of operational modes,
b. an input shaft,
c. means including a belt connecting said motor and said input shaft,
d. means providing coupling between the input shaft and (i) the vaned structure for agitation thereof for the first mode of operation of the motor, (ii) the basket for effecting rotation thereof during a second mode of operation of the motor,
e. an idler pulley for engaging the belt,
f. means for biasing the pulley against the belt to place tension on the belt, and
g. means including the motor windings to overcome the pulley biasing means during energization of the motor start winding to thereby release tension on the belt.

3,978,694

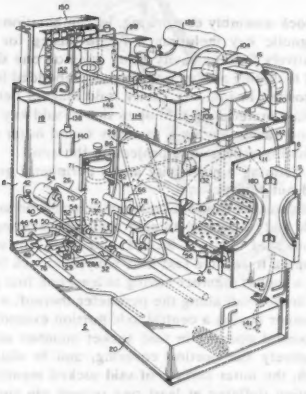
VAPOR SAVING AMBIENT AIR INTAKE SYSTEM FOR A DRY CLEANER

John D. Hughes, Murrysville, Pa., and Al W. Klingensmith, Mansfred, Ohio, assignors to White-Westinghouse Corporation, Cleveland, Ohio

Division of Ser. No. 445,501, Feb. 25, 1974, Pat. No. 3,937,043. This application Sept. 29, 1975, Ser. No. 617,850

Int. Cl.² D06F *43/02, 43/08*

U.S. Cl. 68—18 R **4 Claims**



1. An improved intake air system for a dry cleaning machine having a cabinet, cabinet structure defining an opening in said cabinet, a stationary outer tub and a rotatable inner tub disposed within said cabinet, said tubs having common open ends in alignment with said opening in said cabinet, and door means hingedly attached with said cabinet for movement between an open and a closed position for effectively sealing said opening when in said closed position; and wherein the improvement comprises:

duct means interposed between said cabinet structure defining said opening and said common open ends of said tubs;

a normally off intake fan in communication with said duct means for drawing air therethrough when energized to an on condition;

a normally closed valve means between said duct means and said fan for controlling the flow through said duct means; and,

means responsive to the movement of said door from said closed position to energize said fan and open said valve means whereby room air entering said opening immediately enters said duct means in a path which effectively excludes the interior of said tubs.

3,978,695

APPARATUS FOR DYEING A TRAVELLING STRIP SUCH AS YARN

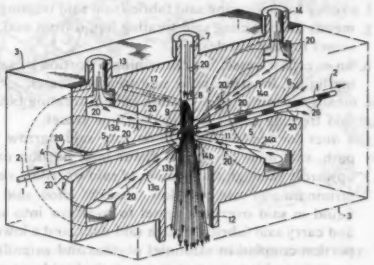
René Hürzeler, Winterthur, and Paul Lincke, Zell, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Mar. 24, 1975, Ser. No. 562,655

Claims priority, application Switzerland, Mar. 29, 1974, 4406/74

Int. Cl.² D06B *1/04*

U.S. Cl. 68—20 **13 Claims**



1. An apparatus for dyeing a travelling strip having

a conveying channel for passage of the strip through a predetermined treatment station;

at least one supply channel having an outlet for supplying a treatment medium to said station in a programmed manner; and

at least one channel downstream of said treatment station relative to the travelling strip and concentric to said conveying channel for supplying compressed air to said treatment station circumferentially of the strip for removing excess treatment medium from the strip.

3,978,696

APPARATUS FOR CONTINUOUSLY RELAXING A TEXTILE FABRIC

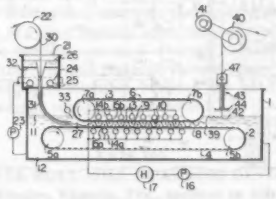
Shyogo Ito, Kaga, and Hiroshi Mizutani, Mie, both of Japan, assignors to Teijin Limited, Osaka; Kitanippon Dyeing & Finishing Co., Ltd. and Nippon Dyeing Machine Manufacturing Co., Ltd., all of, Japan

Filed Apr. 29, 1975, Ser. No. 572,722

Claims priority, application Japan, May 11, 1974, 49-51743

Int. Cl.² D06B *3/10*

U.S. Cl. 68—158 **4 Claims**



1. An apparatus for continuously relaxing a textile fabric comprising, in combination:

a. a treating vessel for containing a treating liquid and a textile fabric to be treated with said treating liquid;

b. a lower open conveyer having numerous openings formed thereon and movable along a closed lower path formed in said treating vessel, said closed lower path having a horizontally extending upper portion;

c. an upper open conveyer having numerous openings formed thereon and movable along a closed upper path

formed above said closed lower path, said closed upper path having a lower portion facing said upper portion of said closed lower path whereby a narrow path in which said fabric is relaxed is formed between said upper portion of said closed lower path and said lower portion of said closed upper path;

d. a plurality of first nozzles, for jetting said treating liquid toward said narrow relaxing path, said nozzles being located outside of said narrow relaxing path along said upper portion of said closed lower path and said lower potion of said closed upper path;

e. a roller for feeding said fabric into said treating vessel;

f. a roller for delivering said fabric from said treating vessel;

g. means for recycling said treating liquid from said treating vessel to said nozzles;

h. an overflow vessel for containing a portion of said treating liquid, located above said treating vessel;

i. means for recycling a portion of said treating liquid from said treating vessel to said overflow vessel;

j. a duct for feeding said fabric into said narrow relaxing path, said duct having an upper inlet portion extending upwardly through the bottom of said overflow vessel and terminating in said overflow vessel to allow said treating liquid in said overflow vessel to overflow into said duct and carry said fabric through said duct, and a lower outlet portion coupled to said inlet portion and extending horizontally and terminating at one end of said narrow relaxing path to allow said treating liquid to be discharged horizontally and to introduce said fabric into said narrow relaxing path; and

k. a plurality of second nozzles aligned above said one end of said narrow relaxing path and above the normal level of said treating liquid in said treating vessel, for jetting a plurality of streams of said treating liquid toward said one end of said narrow relaxing path for assisting the smooth introduction of said textile fabric into said narrow relaxing path while opening said fabric in the lateral direction thereof.

3,978,697

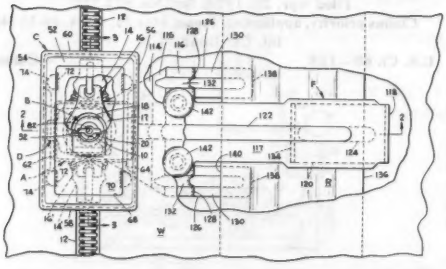
LATCHING DEVICE

Lazlo Bako, Woodcliff Lake, N.J., assignor to Presto Lock Company, Division of Walter Kidde & Company, Inc., Elmwood Park, N.J.

Filed June 5, 1975, Ser. No. 584,053

Int. Cl.[2] E05B *67/30, 65/52*

U.S. Cl. 70—68 **16 Claims**



1. A latching device for releasably locking therein an element having an opening therein, the latching device comprising a frame, key-receiving means having an opening for receiving a key projecting from the frame, the key-receiving means being dimensioned to be received by the opening in the element, a latch member mounted on the frame for movement between a first position overlying the key-receiving means and a second position removed from the key-receiving means, the latch member in the first position being cooperable with the key-receiving means for preventing removal of the element from the key-receiving means, and locking means actuatable by a key inserted in the opening in the key-receiving means for movement between locking and unlocking positions, the locking means being cooperable with means provided by the latch member for releasably locking the latch member in the first position when the locking means is in locking position.

3,978,698

LOCK ASSEMBLY

Zensuke Ono, Izumi, Japan, assignor to Izumi Jiko Co., Ltd., Osaka, Japan

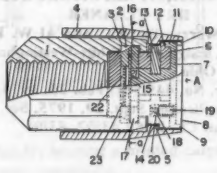
Continuation of Ser. No. 496,631, Aug. 12, 1974, abandoned.

This application Sept. 2, 1975, Ser. No. 609,549

Claims priority, application Japan, Mar. 18, 1974, 49-31346

Int. Cl.[2] F16B *41/00*

U.S. Cl. 70—165 **3 Claims**



1. A lock assembly comprising, in combination:

a magnetic key including a round casing for defining a relatively flat key cavity being open on one side thereof, and including at least one magnet embedded in a material deposited in said key cavity, said magnet being covered by said material on said open side of said key cavity, said round casing having a basically round outer surface but including at least one projection thereon;

a nut defining a nut cavity and a peripheral groove about said nut cavity;

a shell detachably and rotatably mountable on said nut; and

a lock body attached to said shell for securing said shell about said nut in a locked state, said nut cavity being adapted to receive said lock body, said lock body including a socket member having at least one first pin slot and an arched rail along the perimeter thereof, a round plug member having a central axle portion extending through a central opening in said socket member and having a relatively flat portion covering, and in sliding contact with, the outer surface of said socked member, said flat portion defining at least one second pin slot, said lock body further including at least one magnetic pin means operable within said first and second pin slots for selectively locking said plug member with respect to said socket member, said first and second pin slots substantially aligning in said locked state, said plug-member central-axle portion including at the end thereof a flat, elongated guide block extending transverse to said axle portion, said lock body further having latch means for securing said lock body within said cavity, said latch means being operable between an extended locking state and a retracted state, and bias means for biasing said latch means towards said extended locking state, said latch means lockingly engaging said peripheral groove in said locked state, said latch means defining a latch slot on its upper surface, said guide block, extending into said latch slot and thereby engaging said latch means, said plug-member flat portion including recess walls for defining a substantially round, key-receiving, plug-member recess for receiving said magnetic-key round casing, including said projection when it is in a particular orientation relative to said plug member, said magnetic key and said key-receiving plug member thereby cooperatively defining means for rotating said plug member, said plug member on an inner surface thereof, including a lug slidably

engaging said arched rail to cooperatively define means for limiting rotation of said plug member and said guide block between a first guide position and a second guide position, said latch means being moveable between said extending locking state and said retracted state in response to rotation of said guide block, said latch means being in said extended locking state and said retracted state whenever said plug member is in said first guide position and said second guide position, respectively, said magnetic pin means being operable between a normally operative state wherein said plug member is locked and an inoperative state wherein said plug member is freed to rotate in response to said magnetic-key being positioned in said plug-member recess, whereby said plug member is responsively rotatable by said magnetic key.

3,978,699

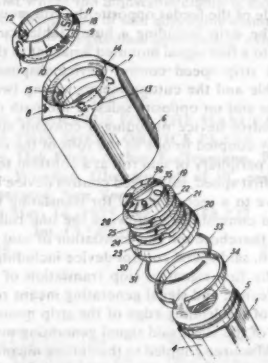
LOCK

Edward Joseph Kay Triniak, London, England, assignor to George Thomas Schlaefli, Tadworth, England

Filed May 1, 1975, Ser. No. 573,534

Int. Cl.² F16B *41/00*; **B65D** *55/14*

U.S. Cl. 70—232 **5 Claims**



1. A locking member assembly, an item provided with means defining a peripheral groove, said locking member assembly being adapted to be releasably secured to said item, said locking member assembly comprising a housing, defining a central channel therethrough, at least one lug provided on said housing protruding into said channel, an annular locking member rotatably mounted on said housing and defining a central aperture co-aligned with the said channel, at least one lug provided on said locking member, a central post rotatably mounted within said central channel a plurality of fins radially extending outwardly from said post and each defining peripheral indentations therein, the indentations in one fin corresponding to the lug or lugs of the housing and the indentations in another fin corresponding to the lug or lugs of the locking member the lugs being located adjacent said fins with a longitudinally extending flange secured to said post, one end of said flange member being chamfered, and a spring located within said passage and adapted to be urged inwardly into engagement with said groove by movement of said post and said flange relative to said housing.

3,978,700

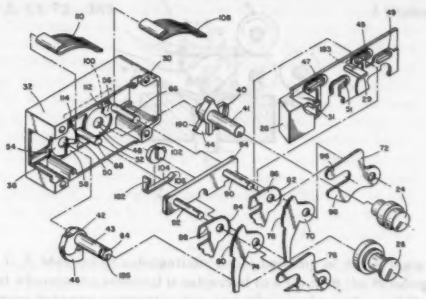
SAFE DEPOSIT LOCK CONSTRUCTION WITH CHANGEABLE TUMBLER MECHANISM

Dwight W. Glass, Rockford, Ill., assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.

Filed Jan. 8, 1975, Ser. No. 539,497

Int. Cl.² E05B *25/00*

U.S. Cl. 70—339 **13 Claims**



1. An improved multiple key lock assembly comprising, in combination:

a housing,

a bolt in said housing, said bolt slidable between a projected, locked position and a retracted unlocked position, said bolt including at least two separate locking projections extending from the bolt transverse to the direction of bolt travel;

at least two separate gate tumblers mounted for engagement with the locking projections of said bolt to prevent sliding movement of the bolt from the locked position, said gate tumblers being pivotally mounted on separate connected posts;

separate means for rotating each of said gate tumblers on said posts to a position of disengagement with the bolt locking projections to permit retraction of the bolt, said means for rotating including separate keys and separate associated pivotal key operated drive tumblers for each key, each drive tumbler engaging a radial portion of each gate tumbler to drive said gate tumbler between bolt engaged and disengaged positions, separate shifters including cam driving surfaces for slidably driving said bolt when the gate tumblers are oriented to permit bolt retraction;

means for translating the connected gate tumbler posts and gate tumblers independent of the bolt and drive tumblers to thereby separate radial engagement of the gate and drive tumblers; and

means for maintaining said gate tumblers, drive tumblers and bolt in a fixed position when the gate and drive tumblers are radially separated whereby the separate keys may be removed and replaced independently to provide a new radial relationship between the gate and drive tumblers upon reengagement thereof.

3,978,701

POWER ROLL MILL GUARDING DEVICE

Charles W. Rhodes, Victoria, Tex., assignor to Alfred L. Burden, Victoria, Tex., a part interest

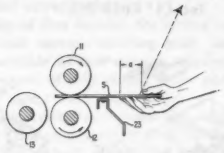
Filed Nov. 6, 1975, Ser. No. 629,534

Int. Cl.² B21B *33/02*; **F16P** *1/00*

U.S. Cl. 72—2 **8 Claims**

1. A guarding device for a roll mill having a pair of parallel, superimposed, counter rotating driven rolls forming a nip between the rolls comprising an elongated guard plate spaced in front of and substantially parallel and coextensive in length with the lower most of said rolls, means for pivotally supporting said guard plate to move toward and away from a neutral

position, resilient means biasing said guard plate to said neutral position, and means for stopping said rolls responsive to the pivotal movement of said guard plate a pre-set distance away from said neutral position, said guard plate having a top edge which is normally positioned adjacent the level of the nip



between said rolls, said means for pivotally supporting said guard plate including resilient means for normally holding the top edge of said guard plate adjacent the level of said nip and for allowing said plate to be depressed downwardly from the level of said nip.

3,978,702

METAL COLD FORMING PROCESS AND LUBRICANT COMPOSITION THEREFOR

George E. Barker, Evanston; Stephen C. Cohen, Highland Park, both of Ill.; John L. O'Brien, Winchester, and Jack Milgrom, Concord, both of Mass., assignors to Van Straaten Chemical Company, Chicago, Ill.

Division of Ser. No. 466,643, May 3, 1974, which is a continuation-in-part of Ser. No. 372,125, June 21, 1973, abandoned. This application Nov. 12, 1975, Ser. No. 631,242

Int. Cl.[2] B21C *23/32*

U.S. Cl. 72—42 **7 Claims**

1. A method of cold extrusion of a ferrous metal workpiece which comprises:

a. applying a liquid lubricant composition directly to the untreated surface of a ferrous metal workpiece, said composition comprising:

1. an inert liquid carrier vehicle selected from the group consisting of water and organic solvents;

2. a chlorine-containing polymer which is film-forming at room temperature, selected from the group consisting of polymers and copolymers of vinyl chloride, vinylidene chloride, and epichlorohydrin and chlorinated polyolefin polymers which are relatively non-corrosive to steel, said liquid composition having a chlorine content in bound polymeric form of from 1.5 to 30% by weight (wet basis); and,

3. a destabilizing agent selected from the group consisting of salts of the transition metals, tin, aluminum and water soluble free radical catalysts selected from the group consisting of peroxides and hydroperoxides, said destabilizing agent being present in an amount of from 0.25 to 10% based on polymer solids.

b. drying the coated workpiece to remove the vehicle and form a dry, essentially continuous, uniform film of the polymeric material and the destabilizing agent on the surface thereof; and

c. subjecting the coated workpiece to a cold extrusion process, said chlorine-containing polymer and destabilizing agent providing an extreme pressure lubricant under the temperature and pressure conditions of the extrusion process.

3,978,703

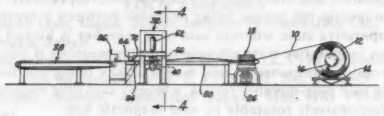
AUTOMATIC STRIP CUTTER

Theodore Primich, Merrillville; David A. Strilich, and David McLeroy, both of Hobart, all of Ind., assignors to Gary Steel Products Corporation, Gary, Ind.

Filed June 23, 1975, Ser. No. 589,253

Int. Cl.[2] B21F *11/00*; **B26D** *5/26*

U.S. Cl. 72—131 **11 Claims**



1. A machine for cutting sections from a coil of an elongated strip having a leading edge comprising, in combination, means for mounting the coil of the elongated strip to be cut for rotation about an axis, a strip feeder having two parallel confronting rolls disposed adjacent to the means for mounting the coil for engaging the strip normal to the axis of elongation thereof, said strip feeder including means for rotating said confronting rolls in opposite directions to pull the strip from the coil at a constant first speed, path defining means mounted on the side of the feeder opposite the coil mounting means for guiding the strip including a hump table, cutting means responsive to a first signal mounted adjacent to the path defining means, a strip speed control device disposed between the hump table and the cutting means having two rolls disposed normal to and on opposite sides of the path of the strip, and speed control device including a constant speed motor mechanically coupled to one of the rolls of the control device to drive the periphery of said roll at a constant second speed less than the first speed, said speed control device including means responsive to a second signal for translating the other roll of the speed control device toward the one roll thereof to grip the strip therebetween the translation of said strip at the second speed, said speed control device including means responsive to the first signal to stop translation of the strip at the cutting device, and signal generating means responsive to the position of the leading edge of the strip mounted adjacent to the path of the strip, said signal generating means including a first signal source coupled to the cutting means and translation stopping means for producing said first signal when the leading edge of the strip is located at a first position on the side of the cutting means opposite the control device and a second signal source coupled to the means for translating the other roll of the speed control device for producing said second signal when the leading edge of the strip is in a second position located between the cutting means and the first position.

3,978,704

CONE SHELL MAKING MACHINE

Rudolf Naumovich Fridman, Zhemchuzhny proezd, 3, kv. 1; Mark Lvovich Katalkherman, ulitsa Kirova, 18, kv. 3, and Sergei Petrovich Chistyakov, ulitsa Volodarskogo, 63, kv. 32, all of Penza, U.S.S.R.

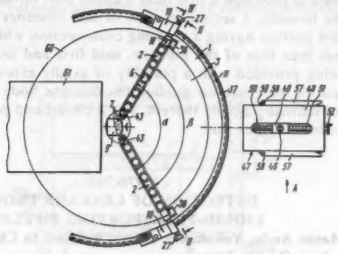
Filed Aug. 1, 1975, Ser. No. 600,973

Int. Cl.[2] B21D *11/00*, *5/00*

U.S. Cl. 72—303 **9 Claims**

1. A machine for making cone shells by coiling sheet blanks in the form of a circular sector comprising: a base; two adjustable clamps secured at one end to said base in a common point and serving to clamp the radial edges of the blank; at least one of said adjustable clamps installed on said base with a provision for turning relative to its fixing point in a plane parallel to said base for moving towards the other one of said adjustable clamps; a pusher located under the blank on the bisectrix of its sector angle with a provision for moving perpendicularly to the plane of the blank and being withdrawn from the converging zone of the adjustable clamps; said two adjustable

clamps, each installed on said base with a provision for turning around its longitudinal geometrical axis; hinges secured on the ends of each of said adjustable clamps, one hinge being se-



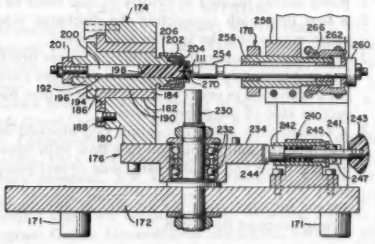
cured at the point where the adjustable clamp is fixed to said base; a device for fixing each of said adjustable clamps against turning around its own longitudinal geometrical axis.

3,978,705

METHOD AND APPARATUS FOR THE MANUFACTURE OF A THIN SHEET ORIFICE PLATE

Larry N. Pearce, Oak Park; Arthur E. Neumann, Winnetka, and Ralph K. Wyssling, Glenview, all of Ill., assignors to Cotton Incorporated, New York, N.Y.

Filed Mar. 14, 1975, Ser. No. 558,237
Int. Cl.² B21D *31/02*
U.S. Cl. 72—325 **21 Claims**



1. A method of manufacturing a thin metal orifice plate having an orifice therethrough comprising the steps of:

positioning an orifice plate blank having a thickness between 0.001 and 0.010 inches in a holding fixture;

supporting at least a portion of the orifice plate blank in the holding fixture with a resilient member;

piercing a generally circular orifice in the resiliently supported portion of the orifice plate blank with a transversely operable punch;

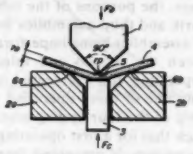
further extending the punch transversely through the resiliently supported portion of the orifice plate blank and into the resilient member so as to localize deformation stresses during formation of the generally circular orifice having a rounded inlet and an outlet circumscribed by an encircling projection extending from the rounded inlet.

3,978,706

PRECISION BENDING WORK METHOD FOR METALLIC MATERIALS

Takeo Nakagawa, and Teiichi Ohtsuki, both of Tokyo, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1974, Ser. No. 536,160
Int. Cl.² B21D *7/06*
U.S. Cl. 72—389 **2 Claims**



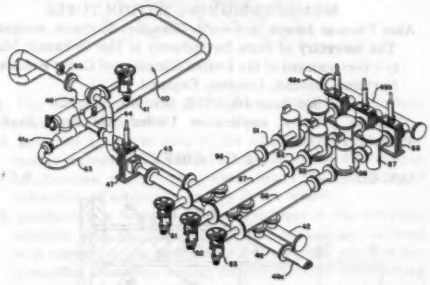
1. A Method of substantially exact bending of metal material wherein the material is subjected to a force in the bending region between supporting dies and wherein the surface of the material on the other side is subjected to a counter force between the supporting dies, characterized in that the force which causes the bending is introduced locally along a line or a narrow area corresponding to the axis of bending, and that the material on the side of and in contact with the counter-force is deformed permanently by this force, the thickness of the material thereby being reduced for forming a localized bend along said line without cracks.

3,978,707

FLOW CONTROL APPARATUS AND SYSTEM

Marvin H. Grove, Houston, and Ronald G. Dunegan, Katy, both of Tex., assignors to M & J Valve Company, Houston, Tex.

Filed Feb. 12, 1975, Ser. No. 549,180
Int. Cl.² G01F *25/00*
U.S. Cl. 73—3 **5 Claims**



1. In flow control apparatus or diverter, a hollow body having its main part annular in section and extended along a central longitudinal axis, flow control means disposed within the body, said flow control means including four sealing assemblies in axial alignment and in spaced relationship (hereinafter termed first, second, third and fourth assemblies in the order at which they are disposed with the fourth assembly nearer the inflow opening), an opening forming an inflow passage at one end of the body and concentric with said axis, the sides of the body having openings forming longitudinally spaced outflow passages, two longitudinally spaced cylindrical sleeves carried by the body, one of the sleeves being located between the outflow passages and the other sleeve being disposed adjacent that outflow passage which is nearest the inflow opening and between such outflow passage and the

inflow passage, means for mechanically connecting all of the sealing assemblies in spaced relationship for conjoint reciprocation within the body with the spacing between successive pairs of assemblies being equal and substantially the same as the spacing between the sleeves, said means comprising tube means aligned with said axis and having a diameter substantially less than the internal diameters of the sleeves and the body, one end of the tube means being in communication with the inflow passage, the portions of the tube means extending between the fourth and third assemblies and also between the second and first assemblies being imperforate and that portion extending between the second and third assemblies being perforate, an operating rod connected to move all of the assemblies to any one of three operating positions, the positional relationship of the four sealing assemblies and the two sleeves being such that for a first operating position fluid flow from the inflow passage is prevented from flowing to either one of the outflow passages by engagement of the first and second assemblies with the sleeves and the outflow passages are isolated from each other, and whereby in a second operating position the second and third sealing assemblies are in sealing engagement with said sleeves whereby flow can occur from the inflow passage to one of the outflow passages and the outflow passages isolated from each other, and whereby in a third position the third and fourth sealing assemblies are in sealing engagement with said sleeves whereby flow may occur from the inflow passage to the second one of the outflow passages and the outflow passages again isolated from each other.

4. A meter proving system comprising a plurality of apparatuses or diverters as defined in claim **1**, a plurality of horizontal meter runs adapted to be connected to the upstream side of a main liquid flow line, the diverters being disposed horizontally with each diverter in alignment with its corresponding meter run, a meter prover header and a discharge header disposed horizontally and connected to corresponding outflow passages of the diverters, a meter prover having a metering loop and piping serving to connect the headers to the end portions of the metering loop.

3,978,708

MEMBERS MOVING WITHIN TUBES

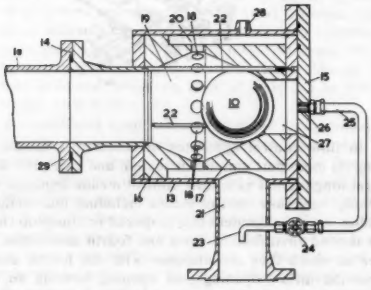
Alan Thomas Joseph Hayward, Glasgow, Scotland, assignor to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed June 10, 1975, Ser. No. 585,521

Claims priority, application United Kingdom, June 12, 1974, 26172/74

Int. Cl.[2] G01F *25/00*

U.S. Cl. 73—3 **8 Claims**



1. A device for arresting a discrete body transported through a closely fitting pipeline by fluid flow, comprising a housing adapted for fluid tight attachment to an open end of the pipeline and provided with an internal chamber for receiving and decelerating said discrete body, said chamber having an open end which communicates with the interior of the pipeline when the housing is connected thereto, a first portion of said chamber adjacent said open end being of a cross-section greater than that of the pipeline, and in which portion there is provided a first fluid transfer port through the wall of the housing, a second portion of said chamber adjacent said first portion having a tapering cross-section which reduces to less than that of the pipeline, said first and second portions being provided with a plurality of axially extending, radially spaced members for guiding the discrete body in movement substantially axially therein, and a closed end portion remote from said open end.

3,978,709

DETECTION OF LEAKAGE FROM LIQUID-TRANSPORTING PIPELINE

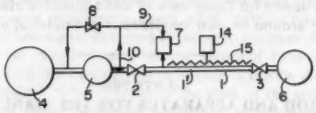
Masao Ando, Yokohama, Japan, assignor to Chisso Corporation, Osaka, Japan

Filed July 18, 1974, Ser. No. 489,654

Claims priority, application Japan, July 19, 1973, 48-82283; Oct. 8, 1973, 48-113055

Int. Cl.[2] G01M *3/08*

U.S. Cl. 73—40.5 R **10 Claims**



1. A system for measuring leakage from a liquid-containing pipeline that includes a liquid inlet end, a liquid outlet end, and a pair of spaced apart block valves mounted between said inlet and outlet ends to form a blocked section of pipeline between said pair of spaced apart valves; the improvement comprising

1. pump means located exteriorly of said blocked section
2. a first flow path connecting the discharge side of said pump means and the suction side thereof,
3. a throttle valve operatively mounted in said first flow path for establishing a minimum pressure that the pump means has to generate in order to cause liquid to flow back to the suction side of the pump means,
4. a second flow path connecting said blocked section of said pipeline and a point on first flow path between said throttle valve and the discharge side of said pump means, and
5. means for measuring the amount of any liquid flowing through second flow path.

3,978,710

APPARATUS FOR DETERMINING THE DEGREE OF GAS IMPERMEABILITY FOR WATCH CASES AND THE LIKE ARTICLES

Michel Ratajski, Bienne, Switzerland, assignor to OMEGA Louis Brandt & Frere S.A., Bienne, Switzerland

Filed July 9, 1975, Ser. No. 594,543

Claims priority, application Switzerland, July 12, 1974, 9613/74

Int. Cl.[2] G01M *3/32*

U.S. Cl. 73—49.3 **3 Claims**

1. An apparatus for testing the gas impermeability of watch cases or like objects, said apparatus comprising:

a first enclosure for receiving the article to be tested;

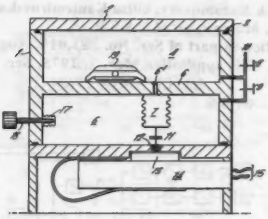
a second enclosure;

means including a means within one of said enclosures and deformable in response to differential pressures for hermetically separating said first and second enclosures;

a variable condenser having a fixed member and a movable member connected to said deformable means;

an electrical oscillator circuit frequency tunable by said variable capacitor;

means for simultaneously pressurizing or evacuating both said enclosures to the same pressure whereby escape of gas from the article being tested effects a differential pressure between said two enclosures thereby deforming



said deformable means and moving said movable member to thereby vary the frequency of said electrical oscillator circuit; and

measuring and display means for providing an indication of variations in said oscillator circuit frequency, said measuring and display means including a stable frequency generator and comparator means for comparing the frequency of said oscillator circuit with the frequency of said stable frequency generator.

3,978,711

METHOD OF TESTING WEAR RESISTANCE OF ARTICLES ON THE BASIS OF POLYCRYSTALLINE CUBIC BORON NITRIDE

Boris Aronovich Glagovsky, prospekt M. Toreza, 15, kv. 49, Leningrad; Anatoly Samoilovich Kamenkovich, ulitsa Tashkentskaya, 15/22, kv. 123, Moscow; Vladislav Sergeevich Lysanov, ulitsa Vavilovykh, 15/3, kv. 7, Leningrad; Igor Borisovich Moskovenko, Kirovsky prospekt, 50, kv. 6, Leningrad; Garri Shmilevich Roitshtein, Kirovsky prospekt, 65, kv. 9, Leningrad; Ljudmila Yakovlevna Slavina, prospekt Shvernika, 16, kv. 80, Leningrad; Leon Izrailevich Feldgun, Ligovsky prospekt, 3/9, kv. 13, Leningrad; Larisa Ruvimovna Frenkel, ulitsa Butlerova, 12, kv. 193, Leningrad; Alexandr Lazarevich Khait, prospekt Maklina, 34, kv. 21, Leningrad; Galina Alexandrovna Shashkina, Kirovsky prospekt, 54, kv. 57, Leningrad; Veniamin Alexandrovich Yashin, prospekt Engelsa 70, kv. 37, Leningrad; Zinovy Illich Kremen, Tikhoretsky propspekt, 10, korpus 2, kv. 54., all of Leningrad, and Yakov Abramovich Muzykant, ulitsa Chusoyskaya, 11, korpus 5, kv.1 113, Moscow, all of U.S.S.R.

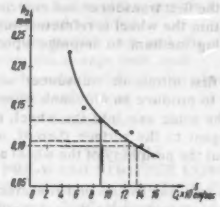
Continuation of Ser. No. 415,902, Nov. 14, 1973, abandoned. This application Aug. 20, 1975, Ser. No. 606,104

Claims priority, application U.S.S.R., Nov. 4, 1972, 1847757

Int. Cl.² G01N *29/00*

U.S. Cl. 73—67.2 5 Claims

1. A method of testing the wear resistance of articles based on the physical properties of polycrystalline cubic boron nitride, comprising the steps of: measuring the rate of propagation of ultrasonic oscillations in a reference article made from cubic boron nitride and having a predetermined resistance to wear equal to the lowest admissible value thereof; comparing the rate of propagation of ultrasonic oscillations in each of the articles being tested with the rate of propagation of ultrasonic oscillations in said reference article; rejecting those articles of the articles being tested having a rate of propagation of ultra-



sonic oscillations lower than the rate of propagation of ultrasonic oscillations in the reference article.

3,978,712

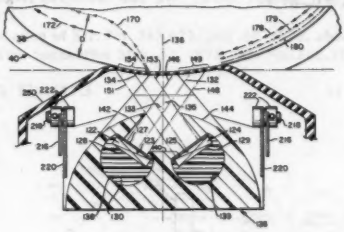
METHOD AND APPARATUS FOR TESTING WEAR, SIZE AND RESIDUAL STRESS CONDITIONS

John Vincent Cowan, Danbury; Gerald De G. Cowan, New Preston, and John Gerald Cowan, Southbury, all of Conn., assignors to Scanning Systems, Inc., Brookfield, Conn.

Continuation-in-part of Ser. No. 199,487, Nov. 17, 1971, Pat. No. 3,812,708. This application May 24, 1974, Ser. No. 473,308

Int. Cl.² G01N *29/04*

U.S. Cl. 73—67.5 R 21 Claims



1. The method of testing the physical condition of a wheel comprising the steps of:

A. coupling a tangent zone of the wheel with an ultrasonic energy transmitting medium having an index of refraction of ultrasonic energy substantially lower than the index of refraction of ultrasonic energy in the wheel;

B. positioning a first ultrasonic transducer in the coupling medium with the sonic axis of the transducer inclined with respect to the tangent zone at an angle wherein low frequency ultrasonic energy delivered to the wheel along the sonic axis enters the wheel, penetrates to a substantial depth therein, and is refracted substantially tangent to the curved surface; and whereby the energy which penetrates the wheel to a substantial depth travels along a path near to and converging toward the curved surface and having a progressively increasing radius of curvature, and thereby migrates toward the curved surface thereof, as it travels along said path;

C. coupling a second tangent zone of the wheel with an ultrasonic energy transmitting medium having an index of refraction of ultrasonic energy substantially lower than the index of refraction of ultrasonic energy in the wheel, said second tangent zone being at a known angular distance from the first tangent zone;

D. positioning a second ultrasonic transducer in the coupling medium at the second tangent zone with the sonic axis of the second transducer inclined with respect to the

tangent zone at an angle corresponding and opposite to the angle of the sonic axis of the first transducer relative to its tangent zone wherein ultrasonic energy delivered to the wheel by the first transducer and entering the tangent zone from within the wheel is refracted out of the wheel to the coupling medium to impinge upon the second transducer;

E. pulsing the first ultrasonic transducer with a low frequency pulse to produce an ultrasonic energy pulse traveling along the sonic axis into the wheel, refracted substantially tangent to the surface thereof, and thereafter traveling about the periphery of the wheel adjacent to the surface;

E. thereafter monitoring the second transducer for receipt of the ultrasonic energy pulse thereat; and

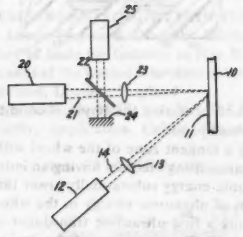
G. measuring the time interval between pulsing the first transducer and receiving the ultrasonic energy pulse at the second transducer wherein the time interval is determined by the length of the circumference of the wheel within the known angular distance and therefore indicates the diameter of the wheel.

3,978,713

LASER GENERATION OF ULTRASONIC WAVES FOR NONDESTRUCTIVE TESTING

Carl M. Penney, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 27, 1975, Ser. No. 581,047
Int. Cl.² G01N *29/04*
U.S. Cl. 73—67.7 **8 Claims**



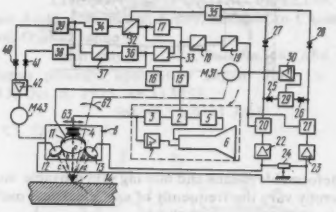
1. In apparatus for nondestructively testing a medium by generating pulses of ultrasonic energy within said medium and measuring the response of said medium to said pulses, the improvement wherein at least a portion of said medium comprises a surface absorbent to optical energy and having a characteristic damage threshold for deleterious surface damage, and further including means for directing an intense pulse of optical energy below said damage threshold onto the absorbent portion of said medium to generate said pulses of ultrasonic energy within said medium.

3,978,714

METHOD OF ULTRASONIC ECHO FLAW DETECTION AND DEVICE FOR EFFECTING SAME

David Solomonovich Shraiber, Leninsky prospekt, 39, kv. 100; Boris Glebovich Golodaev, 9 ulitsa Sokolinoi gory, 3, kv. 253; Boris Alexandrovich Palkin, Sirenevy bulvar, 67, korpus 2, kv. 102, all of Moscow; Leonid Mikhailovich Zakharov, Sovetsky prospekt, 14, kv. 31, Ivanteevka, Moskovskaya oblast; Mikhail Abramovich Genkin, ulitsa Bakuninskaya 8, kv. 26, Moscow; Dmitry Alexandrovich Filippov, ulitsa Saratovskaya, 18/10, kv. 138, Moscow, and Anatoly Fedorovich Razumovsky, ulitsa Kantemirovskaya, 5, korpus 1, kv. 31, Moscow, all of U.S.S.R.

Continuation-in-part of Ser. No. 281,010, Aug. 16, 1972, abandoned. This application Mar. 7, 1975, Ser. No. 556,537
Int. Cl.² G01N *29/04*
U.S. Cl. 73—67.8 S **4 Claims**



1. A method of ultrasonic echo flaw detection of articles, with an echo flaw detector having a detecting head carrying an ultrasonic flaw detecting transducer, said method comprising directing ultrasonic oscillation pulses at an article being checked by the ultrasonic flaw detecting transducer; receiving pulses reflected from the surface of said article and carrying information on the presence of flaws in said article; relatively displacing said head and ultrasonic flaw detecting transducer with respect to said article for scanning the article with ultrasonic oscillations; directing additional ultrasonic oscillations at said article at an angle at the point of entry of the ultrasonic oscillations emitted by the ultrasonic flaw detecting transducer, receiving the additional ultrasonic oscillations as a reflected divergent beam by two further ultrasonic transducers arranged in a plane perpendicular to the direction of the reflected ultrasonic oscillations and symmetrically with respect to the longitudinal axis of the detector head; comparing said additional oscillations to obtain a difference signal; turning the detector head in the plane of its displacement around the point of entry of ultrasonic oscillations, in proportion to the magnitude and sign of the difference signal, to decrease and ultimately reduce to zero the difference signal as the detector head approaches a line normal to the surface of the article; and displacing the ultrasonic flaw detecting transducer along a curvilinear path to direct ultrasonic oscillations at an angle to said article to insure the incidence of the ultrasonic beam perpendicular to the plane of a flaw found under a curvilinear surface of the article and oriented parallel to its flat surfaces.

3,978,715

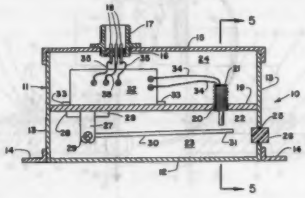
LOW FREQUENCY, HIGH SENSITIVITY ELECTROMECHANICAL TRANSDUCER

Johan T. Farstad, Sunbury, Ohio, assignor to IRD Mechanalysis, Inc., Columbus, Ohio

Filed July 15, 1974, Ser. No. 488,694
Int. Cl.² G01P *15/08*
U.S. Cl. 73—71.2 **1 Claim**

1. A self-contained acceleration measuring device confined within an enclosed housing; a barrier wall dividing the said housing into a first chamber and a second chamber; a nonmagnetic metal beam pivotally mounted at one end on a torsion

pivot in the said first chamber and having an unsupported free end; said first chamber being filled with fluid as a damping means for resisting movement of the said beam; an Eddy current type displacement sensing device mounted in said barrier wall with its sensing tip in the said first chamber and having electrical conductors extending into said second chamber; the said free end of the said beam being disposed in confronting relation with the said Eddy current displacement



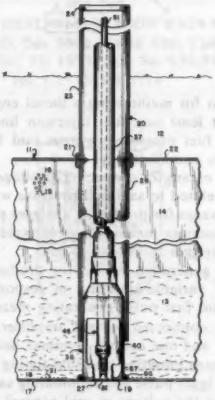
sensing tip in such manner that the instantaneous displacement between the said beam and the said sensing tip corresponds to the instantaneous acceleration applied to the said housing; means within said second chamber for generating an electrical signal directly responsive to the said instantaneous displacement between the said beam and the said sensing tip; and means for converting the said electrical signal directly to an indication of the instantaneous acceleration of the said housing.

3,978,716

METHOD AND APPARATUS FOR DETERMINING INTERNAL EROSION OF STORAGE TANKS AND REPAIR

John A. Kirschke, P.O. Box 125, Boerne, Tex. 78006

Filed Oct. 1, 1975, Ser. No. 618,440
Int. Cl.² G01N *17/00*
U.S. Cl. 73—86 **8 Claims**



5. A method for determining the internal erosion of a storage tank comprising the steps of:

a. placing a casting cup through the filler pipe,
b. sealing the cup against the interior wall of said storage tank,
c. inserting an injector filled with heavy oil into the casting cup,
d. injecting the said heavy oil into the casting cup displacing casting inhibitors from the casting collar,
e. inserting an injector into the casting cup filled with a casting mixture,
f. injecting the casting mixture into the casting cup,
g. permitting the casting cup to remain in position until the casting compound solidifies,
h. removing the casting cup and the solidified negative casting from the storage tank, and
i. inspecting the solidified casting to observe the extent of erosion in the casting area.

3,978,717

INHIBITED PRE-WASH STRIPPER COMPOSITION FOR WATER-WASHABLE INSPECTION PENETRANTS

James R. Alburger, 5007 Hillard Ave., La Canada, Calif. 91011

Filed Jan. 13, 1975, Ser. No. 540,418
Int. Cl.² G01N *19/08, 31/22*
U.S. Cl. 73—104 **2 Claims**

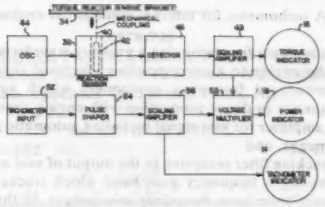
1. In an inspection penetrant process in which a slow-solubility-type water-washable dyed liquid penetrant is applied to a test surface and surface penetrant is removed by washing said penetrant-treated test surface with water, the improvement consisting of a step of surface washing with a stripper composition, said step being introduced prior to finish-washing said penetrant-treated test surface, said stripper composition consisting of water saturated with dissolved slow-solubility penetrant.

3,978,718

ELECTRONIC DYNAMOMETER

Ronald W. Schorsch, 645 SW. 307th, Federal Way, Wash. 98002

Continuation of Ser. No. 383,621, July 30, 1973, abandoned. This application Mar. 31, 1975, Ser. No. 563,317
Int. Cl.² G01L *5/13*
U.S. Cl. 73—117.3 **11 Claims**



1. Electronic engine dynamometer system for engine analysis wherein as an engine having support mounts and a support frame is operated into a load, a reaction force is generated causing displacement of the engine with respect to its mounts and support frame which is proportional to the torque output of the engine, said system comprising:

a. reaction responsive means for reacting to the displacement of said engine,
b. electronic reaction sensing means operatively connected to said reaction responsive means for electronically sensing the amount of motion caused by the torque reaction of the engine and producing a signal proportion to said amount of motion,
c. electronic torque indicator means operatively connected to said sensing means for instant, continuing visual readout of the torque output of said engine,
d. an electronic detector circuit for receiving and converting A. C. signals from said reaction sensing means to D. C. signals is disposed between said reaction sensing means and said torque indicator,

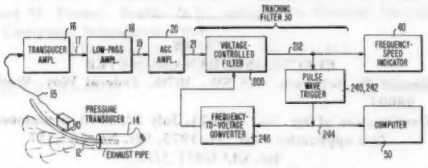
e. electronic tachometer input means for measuring the rotational speed of said engine in rpm,
f. electronic tachometer indicator operatively connected to said tachometer input means for instant continuing visual readout of the rpm of said engine,
g. electronic multiplier circuit means for receiving signals from said reaction sensing means and from said tachometer input means for conversion of said signals to power output, and
h. electronic power indicator operatively connected to said multiplier circuit means for instant, continuing visual readout of the power output of said engine.

3,978,719

TACHOMETER WITHOUT PHYSICAL CONNECTION TO INTERNAL COMBUSTION ENGINE

Stephen Clow Hadden, Cambridge; Leonard Robin Hulls, Marblehead; Patrick John Slaney, Cambridge, all of Mass., and Eldon Marvin Sutphin, Jr., Merrimack, N.H., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 30, 1975, Ser. No. 573,032
Int. Cl.² G01M *15/00*
U.S. Cl. 73—115 **8 Claims**



1. A tachometer for internal combustion engines, comprising,
a transducer for translating a pressure waveform emitted by the engine to a corresponding electrical signal having a prominent frequency component which varies in frequency in direct proportion with engine speed,
an amplifier for said signal including automatic gain control means, and
a tracking filter receptive to the output of said amplifier and having a frequency pass band which tracks and passes said prominent frequency component as the frequency changes due to changes in engine speed,
whereby the output of said tracking filter is an electrical wave having a frequency representing engine speed.

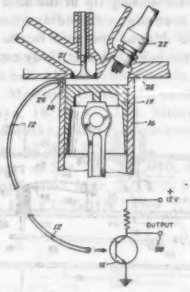
3,978,720

COMBUSTION DETECTOR FOR INTERNAL COMBUSTION ENGINES

Eric Harold Ford, London, England, assignor to Lumenition Limited, England

Filed June 27, 1975, Ser. No. 590,850
Claims priority, application United Kingdom, July 5, 1974, 29983/74
Int. Cl.² G01M *15/00*
U.S. Cl. 73—116 **9 Claims**

1. Apparatus for detecting radiation of a given range of wavelengths from the group comprising visible, intra-red and both visible and infra-red, which radiation is produced as a result of combustion in a given volume within a cylinder of an internal combustion engine, said apparatus comprising a photo-transistor sensitive to the radiation to be detected; a quartz window located in the cylinder at a position beyond that occupied by the piston at top dead center; and a fibre



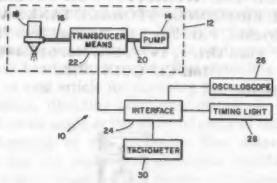
optic light guide, the ends of which are positioned between the quartz window and the photo-transistor.

3,978,721

SYSTEM FOR MAINTAINING A DIESEL ENGINE

Gary E. Clark, and Art J. Miller, both of Chicago, Ill., assignors to Sun Electric Corporation, Chicago, Ill.

Filed Oct. 3, 1975, Ser. No. 619,463
Int. Cl.² G01M *15/00*
U.S. Cl. 73—119 A **9 Claims**



1. A system for maintaining a diesel engine, having a fuel pump and at least one fuel injection line, said fuel pump producing a fuel pressure wave in said fuel injection line, comprising, in combination:
transducer means for producing a voltage signal in response and correlated to said fuel pressure wave;
amplifier means for producing a trigger pulse in response to said transducer means whenever said voltage signal exceeds a trigger threshold;
first pulse generating means for producing a first timing pulse of variable duration in response to said trigger pulse, said first pulse generating means having an input terminal connected to said amplifier means, an output terminal and one control terminal, said first pulse generating means initiating said first timing pulse upon receipt of said trigger pulse and terminating said first timing pulse whenever the voltage at said control terminal exceeds a predetermined termination threshold;
first voltage storage means connected to said control terminal;
first charging means for charging said first voltage storage means in response to initiation of said first timing pulse;
visual output means for producing a visual pulse in response to said first timing pulse; and
control means for controllably charging said first voltage storage means, whereby duration of said first timing pulse is varied according to the speed of said diesel engine.

3,978,722

DYNAMOMETER FOR ANCHORS IN BUILDING CONSTRUCTIONS

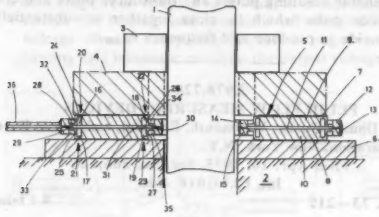
Rainer Glötzl, Karlsruhe, and Franz Glötzl, Rheinstetten, both of Germany, assignors to Firma Franz Glotzl, Germany

Filed Aug. 12, 1975, Ser. No. 603,801

Claims priority, application Germany, Aug. 20, 1974, 2439782

Int. Cl.² G01L 1/02

U.S. Cl. 73—141 R 6 Claims



1. A dynamometer for anchors in building constructions, having a measuring device arranged to be inserted between a fixed support and a fixing nut of the anchor, said measuring device enclosing a pressure measuring fluid and comprising two thick walled rigid annular discs arranged to surround a head of the anchor which annular discs are connected to one another in a pressure-tight manner at outer and inner peripheries of the discs and at a distance from one another so as to form a pressure chamber, the wall thickness of at least one of the two annular discs being weakened in the direct vicinity of the inner and outer peripheries thereof from the side facing the other disc so as to form flexible zones over the whole measuring area.

3,978,723

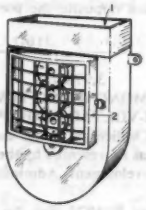
WATER WHEEL ALL SEASON RAIN GAGE

James B. Davis, P.O. Box 5066, Santa Ana, Calif. 92704

Filed Nov. 10, 1975, Ser. No. 630,540

Int. Cl.² G01W 1/14

U.S. Cl. 73—171 6 Claims



1. A gage for measuring atmospheric precipitation comprising: a trough having an inlet for collecting atmospheric precipitation and an outlet for discharging said precipitation, a water wheel driven by said discharged precipitation, a plurality of dial indicators rotated by said water wheel and slotted sleeve bearings used to mount said wheel and said indicators thereby providing lubrication by said precipitation resulting in uniform friction over an extended period.

3,978,724

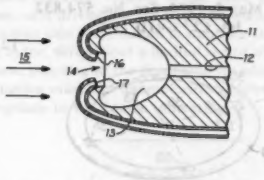
FLUIDIC ANGLE-OF-ATTACK SENSOR

Peter A. Freeman, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 4, 1975, Ser. No. 637,541

Int. Cl.² G01C 21/00

U.S. Cl. 73—180 6 Claims



1. A fluidic sensor for determining angle-of-attack of a flow field impinging on said sensor comprising,

a coanda-effect cavity having a centrally oriented impingement cavity,

first and second output pressure sensing ports positioned on opposide sides of said centrally oriented impingement cavity, and

means for supplying excitation fluid into said coanda-effect cavity at a velocity greater than the velocity of said flow field, said coanda-effect cavity directing a portion of said excitation fluid to alternately enter said first and second output pressure sensing ports and provide equal pressure outputs therefrom when said fluidic sensor is oriented in a zero angle-of-attack position and, when said sensor is oriented in an angle-of-attack other than a zero angle-of-attack position, said flow field impinges on said excitation fluid to provide unequal flow of fluid into said first and second output pressure sensing ports to provide differential pressure proportional to the angle-of-attack of said fluidic sensor relative to said flow field.

3,978,725

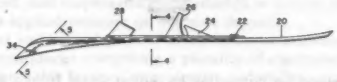
SPEEDOMETER PARTICULARLY FOR WATER SKIS

Frederick Borden Hadtke, New Providence, N.J., assignor to Robert Hain Associates, Inc., Scotch Plains, N.J.

Filed Jan. 7, 1976, Ser. No. 647,423

Int. Cl.² G01P 5/16

U.S. Cl. 73—182 14 Claims



1. A speed indicating apparatus particularly for water skis, said indicator apparatus including: (a) a ski body; (b) a pressure responsive gauge carried on and by the ski body and having indicia and a viewing face so positioned as to be readily visible to the user of the skis and also when the skis are advanced in normal use in the water; (c) a tubular conductor provided in the ski body and having its forward end operatively connected to the pressure responsive gauge and its rear or other end disposed on the underside and toward the trailing end of the ski as used; (d) a flexible diaphragm carried by the ski and disposed so as to close the tubular conductor at a point near its rear opening to the water, and (e) a fluid means filling that portion of the tubular conductor between the operative connection to the pressure responsive gauge and the diaphragm, and in response to the movement of the diaphragm as effected by the rush of water by the rear opening of the

tubular conductor the diaphragm and the fluid in the sealed conductor is moved so as to actuate the gauge to provide an indication thereon of the rate of travel of the ski through the water.

3,978,726

FLUID CURRENT METER

Hsing-Hua Shih, Bowie, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 5, 1975, Ser. No. 574,832
Int. Cl.² G01D 1/00
U.S. Cl. 73—189 **12 Claims**

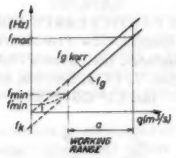
1. Fluid flow measuring apparatus comprising:
a. a plurality of pairs of acoustic transducers;
b. support means for supporting said pairs of transducers such that each said pair is positioned along respective acoustic axes;
c. said support means being constructed and arranged to extend along a generally circular path from one transducer to a next so as to provide an obstruction to fluid flow at an angle of $\pm \theta$ from each said transducer.

3,978,727

METHOD AND DEVICE FOR CORRECTING THE OUTPUT SIGNAL FROM A DIGITAL TRANSDUCER FOR MEASURING A PHYSICAL MAGNITUDE OR VARIABLE

Tor Lennart Bernt Griverus, Nasbydalsvagen 6, 183 31 Taby, Sweden

Filed Nov. 11, 1974, Ser. No. 522,789
Claims priority, application Sweden, Nov. 9, 1973, 7315252
Int. Cl.² G01F 1/05
U.S. Cl. 73—194 E **10 Claims**



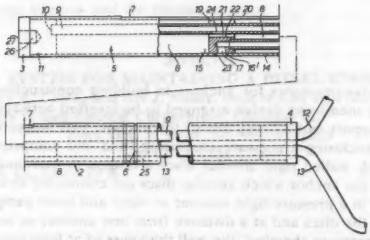
1. A method for correcting an output signal from a digital transducer for measuring a physical magnitude, wherein said output signal is a pulse train of frequency f_g, the transducer frequency f_g being essentially a straight line function of said physical magnitude within the working range of said transducer, said transducer having the inherent quality that in a graphical portrayal of said function including axes representing the transducer frequency and said physical magnitude an extension of said straight line beyond said working range cuts said transducer frequency axis at a point to one side of the zero point of such axis, said method including the step of superimposing a correction pulse frequency of f_k on said transducer pulse frequency f_g to thereby obtain a corrected transducer pulse frequency $f_{g\ korr}$, wherein said corrected transducer pulse frequency $f_{g\ korr}$ is also graphically portrayable as a straight line function of said physical magnitude, said method including the further step of adjusting said correction frequency f_k such that said straight line representation of said corrected transducer pulse frequency $f_{g\ korr}$ cuts substantially through said zero point, the method further comprising:
a. providing correction pulses for superimposition on said transducer pulse train only after occurrence of a said transducer pulse;
b. providing, but limiting to a maximum number, a quantity of superimposed correction pulses per transducer pulse, when the transducer frequency f_g is below its lowest operating frequency; and
c. wherein the step of superimposing the frequencies f_g and f_k includes superimposing the trains of correction and transducer pulses and separating into two clearly distinguishable resulting pulses any transducer pulse and correction pulse which lie close together or substantially coincide to produce said frequency $f_{g\ korr}$.

3,978,728

FLUID FLOW MEASURING DEVICES

George Donald Cutler, Weymouth, England, assignor to Dover Corporation, New York, N.Y.

Filed Apr. 10, 1975, Ser. No. 566,726
Int. Cl.² G01F 1/46
U.S. Cl. 73—212 **4 Claims**



1. In a fluid flow measuring device of the type having an elongate housing member defining a chamber, means defining an aperture in the wall of the housing member opening into the interior thereof positionable in the fluid flow facing upstream, a first tubular probe member mounted in said chamber and having a port connecting the interior thereof with said chamber, and a second tubular probe member having a port opening opposite to the housing member aperture for sensing the suction of the flow impinging against the latter, the improvement in which the aperture defining means comprises an elongate slot extending longitudinally of said housing member opening in a direction opposite the port in the first tubular member.

3,978,729

CIRCUIT FOR MONITORING TEMPERATURE OF HIGH-VOLTAGE EQUIPMENT

Martin E. Jacobs, Chillicothe, Ohio, assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Dec. 9, 1975, Ser. No. 639,134
Int. Cl.² G01K 7/02
U.S. Cl. 73—359 R **9 Claims**

1. A circuit for monitoring the operating temperature of a device situated in a region at relatively high electrical potential and for generating, in a region at a lower electrical potential, an output signal whose frequency is indicative of said temperature comprising:
thermocouple-including circuitry for generating a d.c. voltage proportional to said operating temperature;
a d.c. power supply;
a temperature-compensated operational amplifier for generating a linear ramp voltage whose time of rise varies inversely with the magnitude of said d.c. voltage, said

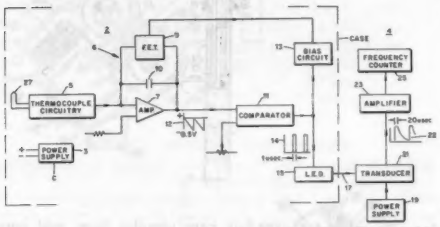
amplifier having an input which is coupled to said circuitry through a resistor;

a comparator circuit operatively coupled to the operational amplifier for producing a negative output voltage when the magnitude of said ramp voltage is below a preselected value and for producing a positive output voltage when the magnitude of the ramp voltage increases to said preselected value;

a capacitor connected across the operational amplifier;

a field-effect transistor connected across said capacitor;

a switching circuit coupled to the output of said comparator circuit for biasing said transistor off when the output voltage of said comparator circuit is negative and for turning said transistor on when the output voltage of said



comparator circuit swings positive and maintaining said transistor on for a time effecting complete discharge of said capacitor;

a light-pulse generating circuit which includes a light-emitting semiconductor component and is coupled to the output of said comparator circuit for energizing said component for a preselected period each time said comparator circuit output swings positive, thereby generating a train of light pulses whose repetition rate is proportional to said operating temperature; and

an output circuit which includes a light-activated semiconductor device optically coupled to said light-emitting component for converting said train of light pulses to an electrical output signal having the same repetition rate.

3,978,730

INDICATING INSTRUMENTS

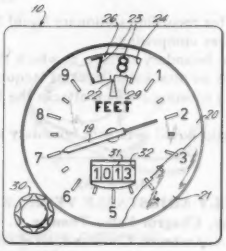
Edward W. Anderson, Cheltenham, England, assignor to Smiths Industries Limited, London, England

Filed Aug. 22, 1975, Ser. No. 606,812

Claims priority, application United Kingdom, Aug. 23, 1974, 37215/74

Int. Cl.² G01L 7/10; G01C 21/00

U.S. Cl. 73—387 **13 Claims**



1. In an indicating instrument having a scale and in which indication of the value of a variable is provided partly by an index that is arranged to rotate through more than one revolution to pass the zero or other datum of the said scale in response to successive changes of unit quantity in the variable, and in which said instrument further includes a member that bears graduation markings in terms of the said unit quantity and means for driving said member relative to the said scale in accordance with rotation of the index, but at a reduced speed compared with said index, to provide coarse indication of the value of the variable in terms of said unit quantity: the improvement wherein the said graduated member is located to be viewed against the datum of the scale thereby to provide the coarse indication by reference to the positioning of its said graduation markings relative to the same datum as used for the index, said driving means including means for driving said member past said scale datum in opposite sense to said index, and the index, throughout a limited sector of its rotation up to the datum, pointing to the graduated member between two of its graduation markings to emphasize which of those markings is appropriate to the coarse indication.

3,978,731

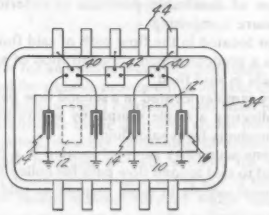
SURFACE ACOUSTIC WAVE TRANSDUCER

Thomas M. Reeder, Glastonbury, and Anthony J. Demaria, West Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 25, 1974, Ser. No. 445,193

Int. Cl.² G01L 9/00, 11/00

U.S. Cl. 73—407 PR **2 Claims**



1. A pressure transducer comprising a dielectric substrate having a pair of thin, flexible diaphragms formed as a portion thereof, said diaphragms being adapted to deform in response to an applied pressure on one side thereof,

first and second pairs of electroacoustic transducers, each transducer comprising a plurality of electrodes disposed on a thin layer of piezoelectric material mounted on said substrate a short distance from said diaphragm such that each pair is mounted on opposite sides of a related one of said diaphragms,

means for actuating first electroacoustic transducers of each pair to generate a pair of series of surface acoustic waves, at least a portion of which propagate across the portion of said substrate including the related one of said diaphragms and intersect a second electroacoustic transducer of the related pair producing a corresponding alternating voltage therein,

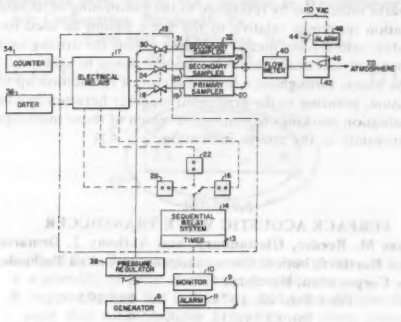
and a pair of electronic feedback circuits, one for each pair of transducers, each including an amplifier connecting the second electroacoustic transducer of the related pair with said first acoustic transducer thereof, each of said feedback circuits having a gain greater than unity and producing a feedback oscillation signal at a frequency which is a function of the velocity changes in said surface acoustic waves produced by deformation of the related one of said diaphragms in response to said applied pressure.

3,978,732

SAMPLING SYSTEM FOR POWER GENERATORS

Thayer L. Dillman, North Versailles, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 1, 1975, Ser. No. 601,579
Int. Cl.² G01N 1/22
U.S. Cl. 73—421.5 R 9 Claims



1. A monitoring and sampling system for a fluid subject to introduction of detectable products of deterioration of the fluid enclosure comprising:

a monitor located in the flow path of said fluid and responsive to a predetermined concentration of said detectable products in said fluid;

a primary sampler located in a second flow path of said fluid for collecting a single sample by separating said detectable products from said fluid;

at least one secondary sampler located in a third flow path parallel to said second flow path for collecting at least one additional sample in same manner as said primary sampler;

valve means responsive to said monitor for permitting flow of said fluid through said primary sampler and not through said secondary sampler during a first time period in which said monitor is detecting said products and through said secondary sampler and not through said primary sampler during a subsequent time period.

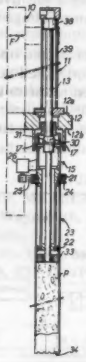
3,978,733

SAMPLER FOR EXTRACTING CORE SAMPLES

Patrick Paul Avot, Outreau, France, assignor to F. A. P. M. O., Boulogne-sur-Mer, France

Filed Mar. 8, 1974, Ser. No. 449,377
Int. Cl.² G01N 1/08
U.S. Cl. 73—423 R 8 Claims

1. A sampler for extracting core samples from a mass, comprising a support, an operating jack including a cylinder fixed to the support and a first piston arranged for displacement in said cylinder, means for admitting pressure fluid to said cylinder to displace said first piston axially in said cylinder, a rod carrying said first piston, a second piston on said rod remote from said first piston, a sleeve member directly received on said rod intermediate said first and second pistons, a core cutter comprising a hollow cylindrical body with a cutting edge at its one end remote from the jack, means mounting said core cutter for axial displacement with and rotation on and relative to said sleeve member, said sleeve member having a portion that projects axially beyond the other end of said core cutter in the direction of said jack, power means mounted on said projecting portion of said sleeve member for rotating said core cutter relative to said sleeve member, said second piston being axially displaceable in said core cutter, and means for selectively securing said projecting portion of said sleeve member to said rod for axial displacement of said core cutter into and out of a mass to be sampled in response to axial displacement of said first piston, and alternatively selectively securing said projecting portion of said sleeve member to said support for axial displacement of said rod relative to said sleeve member for expelling core samples from said core cutter in response to displacement of said first piston toward said cutting edge.

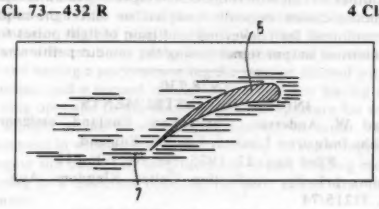


3,978,734

METHOD FOR RECORDING STATIONARY FLOW PATTERNS AT BOUNDARY SURFACES

Horst Güssefeld, Uttenreuth, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 11, 1975, Ser. No. 612,451
Claims priority, application Germany, Sept. 23, 1974, 2545398
Int. Cl.² G01M 1/00
U.S. Cl. 73—432 R 4 Claims



1. A method for recording stationary liquid flow patterns at boundary surfaces comprising:

a. coating the boundary surface at which flow is to be recorded with an attackable layer of lacquer;

b. dissolving a substance which attacks the lacquer layer in a liquid;

c. directing said liquid over said boundary surfaces.

3,978,735

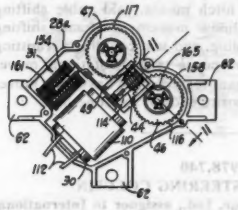
ELECTRICALLY ADJUSTABLE VEHICLE ACCESSORY

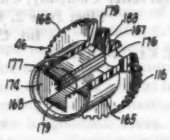
Laszlo N. Repay, Chagrin Falls; Thomas A. Young, Burton, and Andrew A. Amberik, Cleveland, all of Ohio, assignors to Tenna Corporation, Warrensville Heights, Ohio

Filed May 16, 1974, Ser. No. 470,570
Int. Cl.² F16H 27/02
U.S. Cl. 74—89.15 7 Claims

1. A drive nut for use with a screw, comprising a body with a central passage in which a screw is receivable, axially extending cavities of the body that open into the passage, means

carried by said body in the cavities to act against external threads of a screw in said central passage to drivingly interconnect the body with a screw so that relative rotation between the screw and body will move one relative to the other in a direction axially of the screw, said means being movable from a position at least partially within said passage in engagement with the threads of a screw to a position radially outwardly therefrom out of engagement with the threads in response to relative axial movement between the two without relative rotation or in response to relative rotation between the two without relative axial movement, said means including at least





two peripherally displaced members with partial threads, each carried in one of said axially extending cavities, and spring means yieldably resisting movement of the members radially outward of the central passage; each threaded member being of an axial length less than that of the cavities by an amount less than the pitch of the screw to be used, each member being movable axially and radially within the cavity, and the peripheral location of the members being correlated with the axial limits of the respective cavity so that the two inserts abut opposite ends of the respective cavities when threadedly engaged with the screw.

3,978,736

PILGRIM STEP INDEXING MECHANISM

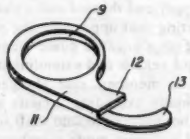
Hans Igelhaut, Leerstetten, Germany, assignor to Triumph Werke Nurnberg A.G., Nurnberg, Germany

Filed May 22, 1975, Ser. No. 579,894

Claims priority, application Germany, Jan. 16, 1975, 2501578

Int. Cl.² F16H *27/02*

U.S. Cl. 74—112 **6 Claims**



1. Indexing mechanism comprising

a shaft to be indexed,

a pair of ratchet wheels fixed to said shaft, said ratchet wheels having oppositely facing teeth,

a single pawl having a pair of spaced teeth operative to engage one and then the other of said ratchet wheels,

and cyclic means for driving said pawl to rotatively index said ratchets in a first direction through a predetermined angular increment and in a second direction through a larger angular increment.

3,978,737

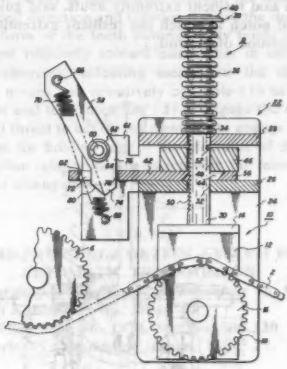
CHAIN TENSIONING DEVICE

Ward E. Bailey, Plano, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 27, 1975, Ser. No. 608,118

Int. Cl.² F16H *7/12, 7/10*

U.S. Cl. 74—242.11 C **10 Claims**



1. A tensioner for an endless member comprising: a support, a shaft mounted for slidable movement in an axial direction on said support, a tension wheel carried by said shaft for rotation about an axis transverse to the shaft axis, means for urging said shaft in an endless member tensioning direction, a detent member slidably mounted on said support for reciprocal movement in a direction transverse to the axis of said shaft, an opening in said detent member through which said shaft extends, first detent means on an axially extending portion of said shaft, second detent means on the opposite side of said shaft, third and fourth detent means on said detent member, said first and third detent means being so constructed and arranged to engage each other and allow movement of said shaft in said tensioning direction and prevent movement thereof in the opposite direction when said detent member is in an endless member tensioning position, said second detent means being axially spaced from said fourth detent means when said detent member is in said endless member tensioning position, said second and fourth detent means being so constructed and arranged to engage each other to prevent movement of said shaft in said endless member tensioning direction when said detent member is out of said endless member tensioning position and in an endless member loosening position, and means for moving said detent member into either said endless member tensioning position or said endless member loosening position.

3,978,738

TOGGLE MANIPULATOR

Michel Naulin, Angouleme, France, assignor to La Telemecanique Electrique, France

Filed Dec. 24, 1974, Ser. No. 536,174

Claims priority, application France, Dec. 26, 1973, 73.46286

Int. Cl.² G05G *9/00*

U.S. Cl. 74—471 XY **5 Claims**

1. A manipulator, for the operation of switches, comprising:

i. a body

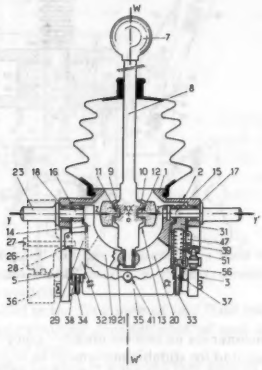
ii. a first pivoting device pivotably mounted in said body by first pivot means

iii. a second pivoting device pivotably mounted in said body by second pivot means, the respective pivoting axes of said first and second pivot means being perpendicular and meeting at a point

iv. a control rod mounted on said first pivoting device by means of a bearing the centre of which coincides with said meeting point, said rod having an extension in permanent contact with a portion of said second pivoting device,

v. at least one lever pivotable about one of said pivot means and including an extremity which is radially resilient

vi. a curved concave guide fast with the body and against which said resilient extremity abuts, said guide having a central notch in which the resilient extremity rests in a rest position of the rod



vii. return spring means having first and second ends, said first end being coupled to said lever in the neighbourhood of said resilient extremity, said second end being coupled to the body at a point such that the direction of the spring means makes an angle of 45° with the direction of the lever

viii. a coupling member fast with the first pivoting device and bearing against said lever in a direction corresponding to the extension of said return spring means.

3,978,739

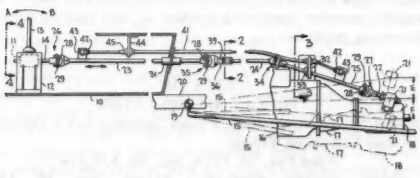
TRANSMISSION SHIFT CONTROL

Dean Hobbensiefken, Rte. 1, Box 241, Lyons, Oreg. 97358, and Michael A. Signa, 1204 Hirsch St., Melrose Park, Ill. 60160

Filed July 23, 1975, Ser. No. 598,289

Int. Cl.² G05G 9/16

U.S. Cl. 74—473 R **7 Claims**



1. In a transmission shift control mechanism wherein a gear shift actuator is mounted on a main frame and a gear transmission for the engine having a shift control is mounted on a sub-frame, hitch means on said main frame for pivotally connecting said sub-frame thereto, linkage means interconnecting said shift actuator with said transmission shift control, means on said shift actuator connected to said linkage means for linearly and rotationally shifting said linkage means to effect a gear shifting of the gear transmission, said linkage means comprising:

a plurality of links interconnected together for articulated movement about an axis not coincident with the pivot axis of said hitch means;

a coupling on one of said links permitting it to linearly collapse and extend but preventing relative rotational movement between opposite ends of said one link; and

a resilient cable fixedly secured at opposite ends to a forward and to a rearward one of said links so as to span said coupling;

whereby linear and rotational movements of said gear actuator are transmitted to said transmission shift control through said linkage means during pivotal movement of said subframe at said hitch means, said cable shifting linearly to effect said linear movement of said shifting means across said coupling, and said coupling permitting said links to rotate in response to said rotational movement of said shifting means regardless of any linear movement between said opposite ends of said one link.

3,978,740

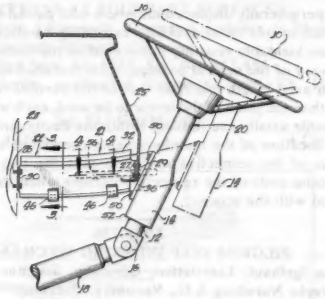
ADJUSTABLE STEERING COLUMN

Robert J. Selzer, Fort Wayne, Ind., assignor to International Harvester Company, Chicago, Ill.

Filed June 2, 1975, Ser. No. 583,351

Int. Cl.² B62D 1/18

U.S. Cl. 74—493 **10 Claims**



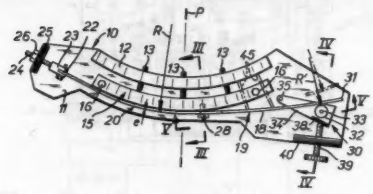
1. An improvement in a steering wheel assembly for a motor vehicle having an upper steering shaft with a steering wheel affixed on the upper end thereof and a shaft support member rotatably supporting said upper steering shaft, said improvement comprising an elongated guide member secured to the body of said motor vehicle and extending transversely towards said shaft support member, said elongated guide member having longitudinally extending arcuate guideway, an elongated slide member secured to said shaft support member and slidably engaged with said guide member, said slide member having longitudinally extending follower portion of the same arcuate configuration as said arcuate guideway, said follower portion being disposed in a slidable interfitting relation with said guideways of said guide member, said arcuate guideway having a curvature shaped to cause the simultaneous two directional movement of said steering wheel in the fore and aft direction and in the up and down direction in response to any displacement of said slide member along said guide member, and lock means for selectively holding said slide member in one of a plurality of pre-set fixed positions along said guide member.

3,978,741

VARIABLE-PROFILE CAM, ESPECIALLY FOR A REPRODUCING MACHINE

Bruno Bettiol, Quincy-Voisins, France, assignor to Essilor International "Cie Generale D'Optique", Joinville-le-Pont, France

Filed Nov. 26, 1974, Ser. No. 527,296
Claims priority, application France, Dec. 4, 1973, 73.43129
Int. Cl.² F16H *53/04*
U.S. Cl. 74—568 R **21 Claims**



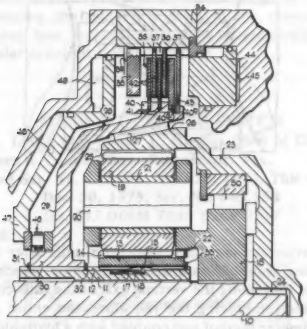
1. A variable profile cam for a machine tool comprising a thin resilient strip having two longitudinal faces, one of the two longitudinal faces of said strip defining a cam surface, two spaced apart support means for supporting a span of said strip for bending therebetween, means for varying the curvature of the strip including adjustment means associated with at least one of said support means for bending said strip elastically generally perpendicularly to its two longitudinal faces, the transverse moment of inertia of the span of said strip being varying lengthwise of said strip intermediate said support means, whereby the curvature of said strip may be adjusted by said adjustment means for determining the profile of said cam surface as desired.

3,978,742

EPICYCLIC GEAR ASSEMBLIES

Randle Leslie Abbott, Tamworth, England, assignor to GKN Transmissions Limited, Birmingham, England

Filed Oct. 23, 1974, Ser. No. 517,196
Claims priority, application United Kingdom, Nov. 8, 1973, 51782/73; Apr. 24, 1974, 17844/74
Int. Cl.² F16H *3/74, 57/10*
U.S. Cl. 74—751 **6 Claims**



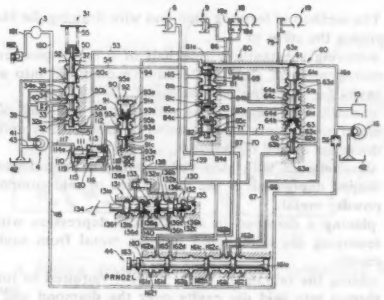
1. An epicyclic gear change assembly comprising: a casing; an epicyclic gearing having three members viz, a sun gear, an annulus gear, and a planet gear carrier carrying planet gears or planet gear clusters which mesh with the sun and annulus gears, the meshing teeth of the gears being of helical form; a friction clutch having an engaged stage in which it frictionally connects two of said members together for rotation and a disengaged stage in which said two members can rotate relatively to one another; locking means for positively locking together two of said members for rotation, said locking means comprising first and second inter-engageable elements relatively movable in directions parallel to the axis of rotation of the sun gear and when engaged locking said members together; spring means for releasably holding said elements out of engagement; said locking means being arranged so that when power is transmitted through the assembly in a predetermined direction and rotational sense the thrust due to the helical form of the teeth automatically tends to displace said elements relatively toward each other in order to engage said elements; actuating means for the clutch and the locking means and selectively operable (1) to disengage the elements and the clutch and (2) to engage the clutch and to allow said thrust to act on the elements to engage them; and brake means for holding one of the elements of the gearing against rotation relative to the casing with the inter-engageable elements disengaged.

3,978,743

FLUID PRESSURE CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Noboru Murakami, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sept. 16, 1974, Ser. No. 506,330
Claims priority, application Japan, Sept. 27, 1973, 48-104735
Int. Cl.² B60K *41/18*
U.S. Cl. 74—869 **4 Claims**



1. A fluid pressure control system for automatic transmission, comprising;
- a fluid pressure source;
- a fluid pressure regulating valve for regulating the hydraulic fluid from said fluid pressure source to a particular line pressure;
- a plurality of frictional engaging means actuated by said line pressure from said fluid pressure regulating valve for attaining a particular gear ratio within the gear trains of said transmission interposed between an input shaft and an output shaft;
- a governor valve for generating a governor pressure which is increased or decreased in response to the rotational speed of said output shaft;
- a manual shift valve operatively connected to said fluid pressure regulating valve for supplying said line pressure to said plurality of frictional engaging means;
- a throttle valve fluidically connected to said manual shift valve for generating a throttle pressure responsive to an engine throttle valve;
- shift valve means actuated in response to said governor pressure and said throttle pressure for automatically selectively actuating said plurality of frictional engaging means; and

a pump means to generate an output pressure which is proportional to rotational speed of said engine; and

a creep preventing valve actuated in response to said governor pressure and said output pressure which is proportional to rotational speed of said engine for automatically reducing said line pressure by an amount which is unable to actuate said plurality of frictional engagine means.

3,978,744

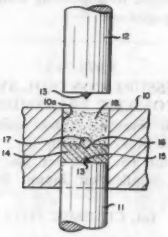
DIAMOND WIRE DRAWING DIE BLANKS AND METHODS OF MAKING THE SAME

Neil J. Zachman, Kokomo, Ind., assignor to Cabot Corporation, Kokomo, Ind.

Filed Mar. 17, 1975, Ser. No. 559,122

Int. Cl.² B21K *5/20*; **B22F** *7/08*

U.S. Cl. 76—107 A **8 Claims**



1. The method of forming diamond wire drawing die blanks comprising the steps of

a. metering substantially one half of a metal powder required to form a shroud around a diamond into a die cavity for receiving powder metal;

b. partially compressing said substantially one half of the metal powder into a flat member of substantially uniform thickness in said die cavity;

c. simultaneous with step (b) forming a central conical shaped depression in the top surface of said compacted powder metal;

d. placing a diamond in said conical depression without removing the compacted powder metal from said die cavity;

e. adding the remaining metal powder required to form a shroud into said die cavity over the diamond and said partially compressed one half without removing the compacted powder metal from said die cavity;

f. compressing said remaining metal powder and said substantially one half of metal powder around said diamond in said die cavity; and

g. sintering said metal powder compact.

3,978,745

NUMERICALLY CONTROLLED AUTOMATIC LATHE

Shouichi Okamoto, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Izumi, Japan

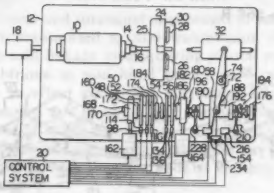
Filed Sept. 25, 1975, Ser. No. 616,707

Claims priority, application Japan, May 27, 1975, 50-62527; July 1, 1975, 50-92052[U]

Int. Cl.² B23B *3/00*, *3/28*

U.S. Cl. 82—2 B **9 Claims**

1. A numerically controlled automatic lathe comprising, in combination: a headstock having a rotatable spindle to support a workpiece; a plurality of tool holding means movable toward and away from said workpiece; numerically controlled first and second drive means; a first main cam shaft drivably connected to said first drive means; a second main cam shaft drivably connected to said second drive means; at least one auxiliary cam shaft drivably connectable to one of said first and second main cam shafts; a plurality of master cams having uniform-motion cam lobes and carried on said first, second and auxiliary cam shafts; a plurality of connecting means connected to said plurality of tool holding means, respectively; first means for selectively providing drive connections between those of said plurality of master cams carried on said first and second main cam shafts and corresponding ones of said connecting means; and second means for selectively



drivably connecting said auxiliary cam shaft to said one of first and second main cam shafts; said first and second means being operative to drivably connect selected ones of said plurality of master cams to corresponding ones of said plurality of tool holding means whereby selected ones of said plurality of tool holding means may be concurrently fed toward said workpiece at given feed rates.

3,978,746

DEVICE FOR REMOVING FLASH AFTER RESISTANCE BUTT WELDING OF RAILS

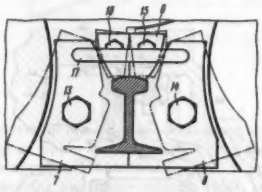
Sergei Ivanovich Kuchuk-Yatsenko, ulitsa Filatova, 1/22, kv. 47; Sergei Alexandrovich Solodovnikov, ulitsa Vernadskogo, 63, kv. 44; Vasily Alexeevich Sakharnov, Bulvar Likhacheva, 3, kv. 64; Ivan Korneevich Golomovzjuk, ulitsa Vetryanaya, 28, kv. 1; Alexandr Ivanovich Kulesh, ulitsa Kudryashova, 6, kv. 39, and Fedor Konstantinovich Porkhun, ulitsa Malaya Kitaevskaya, 73, kv. 56, all of Kiev, U.S.S.R.

Filed May 15, 1975, Ser. No. 577,941

Claims priority, application U.S.S.R., May 30, 1974, 2027967

Int. Cl.² B23C *3/12*

U.S. Cl. 83—1 **1 Claim**



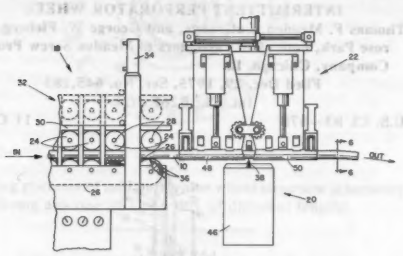
1. A device for removing flash from rails after resistance butt welding mounted on a welding machine, which incorporates cases split along the vertical axis of the rails comprising: three cutters embracing the rail along the entire cross-sectional perimeter thereof and coupled with a hydraulic cylinder drive; one of said cutters pivotally mounted on one of said cases is split along the vertical axis thereof and contacts the rail rolling surface following the shape thereof while the other two of said side cutters embracing the sides of the rail head, the web and the base flange of the rail are arranged symmetrically relative to the vertical axis of said case and hinge-connected thereto, the top portions of side cutters being linked by an articulated rod.

3,978,747

METHOD AND APPARATUS FOR SEVERING REINFORCED ELASTOMERIC TUBULAR ARTICLES

Ivan R. Lyon, Galesburg, Ill., assignor to The Gates Rubber Company, Denver, Colo.

Filed Mar. 24, 1975, Ser. No. 561,400
Int. Cl.² B26D 3/22, 7/14
U.S. Cl. 83—18 18 Claims



1. A method for severing reinforced polymeric generally tubular articles into predetermined lengths comprising:

threading the tubular article axially through a clamping fixture normally having an internal dimension which is greater than the outer diameter of the tubular article, said clamping fixture having longitudinally spaced portions between which is defined a cutting plane substantially normal to the longitudinal disposition of the tubular article;

advancing the tubular article a predetermined distance through the clamping fixture;

clamping the tubular article in the fixture so as to hold it securely, preventing longitudinal displacement thereof;

while continuing to clamp the tubular article as specified above, bending the tubular article in the area immediately proximate to the cutting plane to define a concavo-convex arc surface while simultaneously advancing the convex portion of the concavo-convex surface into contact with a cutting means disposed along the cutting plane;

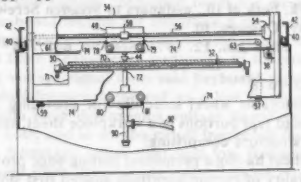
further bending the tubular article and stretching both the concavo and convex portions of the article longitudinally so that the concavo-convex arc defined thereby is determined by a progressively smaller radius while simultaneously further longitudinally stretching the article and advancing the convex portion of the concavo-convex surface into the cutting means progressively until the tubular article is fully severed.

3,978,748

FLUID JET CUTTING SYSTEM

Elmer N. Leslie, and Bobby L. Higgins, both of Dallas, Tex., assignors to Camsco, Inc., Richardson, Tex.

Division of Ser. No. 527,098, Nov. 25, 1974. This application Dec. 30, 1975, Ser. No. 645,158
Int. Cl.² D06H 7/00; B26F 3/00
U.S. Cl. 83—53 16 Claims



1. Apparatus for cutting a workpiece comprising:

a. a source of fluid;

b. means for intensifying the pressure of said fluid coupled to said source;

c. means for supporting the workpiece comprising a plurality of flexible supports;

d. a nozzle movable in relation to said support means;

e. conduit means communicating between said nozzle and said intensifying means for supplying fluid under pressure to said nozzle;

f. means to effectuate a discharge of fluid from said nozzle to cut through the workpiece;

g. means disposed under said support means, on the side of the workpiece opposite the nozzle and movable in correspondence with the movement of said nozzle to receive the fluid discharge from the nozzle and thereby reduce the splashback of fluid on the workpiece;

h. a sensor for determining the distance between the nozzle and the workpiece; and

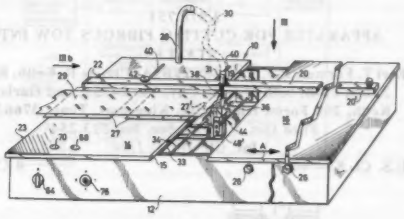
i. means for moving the nozzle to vary the distance between the nozzle and the workpiece.

3,978,749

CUTTING DEVICE FOR COATED PLATES

Walther Polenz, Wiesbaden, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed Nov. 17, 1975, Ser. No. 632,806
Claims priority, application Germany, Nov. 20, 1974, 2454919
Int. Cl.² B26F 3/08
U.S. Cl. 83—169 15 Claims



1. A cutting device for coated plates comprising frame means,

first stationary cover plate means on said frame means,

second movable cover plate means on said frame means,

heatable knife means adapted to be displaced along one edge of said first stationary cover plate means between said first and second cover plate means,

carriage means below said cover plate means for supporting said knife means,

and means for displacing said carriage means and said knife means supported thereby.

3,978,750

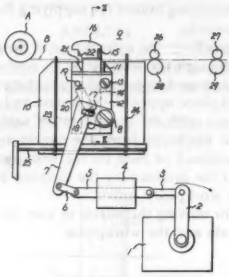
APPARATUS FOR ADJUSTING A FREQUENCY OF AN OSCILLATING ELEMENT PROVIDED A HAIR SPRING

Souichi Inoue, Yokohama; Katsumi Kato, Tokyo, and Yoshiharu Marumo, Matsudo, all of Japan, assignors to Kabushiki Kaisha Seikosha, Japan

Filed June 18, 1975, Ser. No. 587,872
Claims priority, application Japan, June 18, 1974, 49-69499
Int. Cl.² B26D 5/20
U.S. Cl. 83—208 2 Claims

1. Apparatus for adjusting the frequency of an oscillating element provided with a hair spring comprising: a converter circuit which converts into predetermined signal pulses an oscillating output signal of said oscillating element having its oscillation period determined by said hair spring, a first control circuit which controls passage of clock pulses by the

output pulses of said converter circuit, a first counter which counts the clock pulses having passed through said first control circuit, a second control circuit which controls passage of reference pulses, a second counter which counts the reference pulses having passed through said second control circuit, a coincidence circuit which detects coincidence between count



contents of said first counter and said second counter, first means to control said second control circuit by the coincidence output and to check said reference pulses to said second counter, and mechanical means to transport said hair spring during the counting operation of said second counter and to cut an unnecessary part of said hair spring after said first counter has counted a predetermined value.

3,978,751

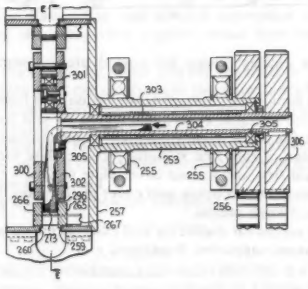
APPARATUS FOR CUTTING FIBROUS TOW INTO STAPLE

Earl T. Farmer, R.F.D. 3, Box 22B5A; Claude R. Keith, R.F.D. 2, Box 68-B, both of Gate City, Va. 24251, and Garland B. Keith, 208 Forest Hills Drive, Kingsport, Tenn. 37663

Filed Oct. 9, 1974, Ser. No. 513,254

Int. Cl.[2] D01G *1/04*

U.S. Cl. 83—403 **8 Claims**



1. An apparatus for cutting staple fibers, comprising:

A rotatable cam assembly, including a first rotatable shaft, an axial bore in said first rotatable shaft dimensioned to allow passage of a tow there thru, a disc affixed to one end of said first rotatable shaft, a bore centrally positioned in said disc and aligned with said bore of said first rotatable shaft, a plurality of idler rollers axially aligned with said first rotatable shaft and mounted on said disc, and endless belt supported by said plurality of idler rollers, and means for guiding a tow exiting said shaft and disc bores into traction contact with said endless belt; and

a rotatable knife assembly, including a second rotatable shaft, an axial bore in said second rotatable shaft dimensioned to permit passage there thru of said first rotatable shaft, a knife support means rigidly affixed to one end of said second shaft perpendicular to the axis thereof and dimensioned to encompass said rotatable cam assembly thereof, and a knife supported by said knife support means and positioned thereby for cutting engagement with a tow at said traction contact with said endless belt.

3,978,752

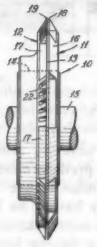
INTERMITTENT PERFORATOR WHEEL

Thomas F. Meaden, LaGrange, and George W. Fieberg, Melrose Park, both of Ill., assignors to Meaden Screw Products Company, Chicago, Ill.

Filed Dec. 29, 1975, Ser. No. 645,283

Int. Cl.[2] B26F *1/20*

U.S. Cl. 83—678 **11 Claims**



1. An intermittent perforator wheel structure for providing a tearing edge in a workpiece sheet, comprising:

a first wheel having a peripheral cutting edge provided with a plurality of elongated recesses spaced apart by elongated cutting edge portions;

a second wheel having a peripheral cutting edge provided with a plurality of spaced groups of short recesses spaced apart by short cutting edge portions, and a plurality of elongated recesses intermediate said groups; and

means for coaxially securing said wheels with said peripheral edges juxtaposed and with said groups of short recesses of said second wheel aligned one each with said elongated recesses of said first wheel whereby said elongated cutting edge portions of said first wheel comprise means for providing a plurality of spaced elongated slits in a workpiece sheet and said short cutting edge portions of said second wheel comprise means for providing a plurality of spaced short perforation slits in the workpice sheet intermediate the elongated slits cooperatively defining a tearing edge having alternating spaced long slits and groups of short perforation slits.

3,978,753

ADJUSTABLE PERFORATOR WHEEL

Thomas F. Meaden, LaGrange, and George W. Fieberg, Melrose Park, both of Ill., assignors to Meaden Screw Products Company, Chicago, Ill.

Filed Jan. 12, 1976, Ser. No. 648,748

Int. Cl.[2] B26F *1/20*

U.S. Cl. 83—678 **13 Claims**

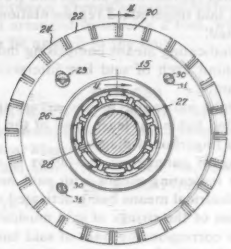
1. A perforator wheel structure for providing adjustable length spaced tear portions in a workpiece sheet, said perforator wheel structure comprising:

a first wheel having a peripheral cutting edge provided with a plurality of circumferentially spaced first slots;

a second wheel having a peripheral cutting edge provided with a corresponding plurality of circumferentially spaced second slots; and

means adjustably coaxially securing said first and second

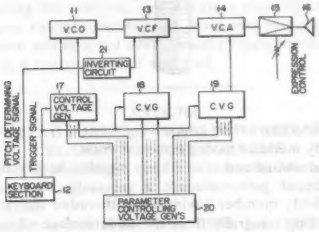
wheels with said cutting edges juxtaposed and with said first slots overlapping said second slots to define nonslitting portions of said perforator wheel structure selectively having any one of a plurality of different lengths.



3,978,754
VOLTAGE CONTROLLED TYPE ELECTRONIC MUSICAL INSTRUMENT

Takeshi Adachi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Feb. 25, 1975, Ser. No. 552,755
Claims priority, application Japan, Feb. 28, 1974, 49-23925[U]
Int. Cl.² G10H 1/00, 5/02
U.S. Cl. 84—1.21 **3 Claims**



1. An electronic musical instrument comprising:

a keyboard section including keys and means for generating in response to key operation a pitch determining voltage signal having a voltage representing the note of an operated key and a trigger signal indicative of the actuation of the key;

voltage controlled oscillator means coupled to said keyboard section and responsive to the pitch determining voltage signal to generate a tone signal having a pitch frequency determined by said pitch determining voltage signal;

voltage controlled filter means including a voltage controlled variable cutoff frequency setting means and coupled to said voltage controlled oscillator means and to said keyboard section for imparting a tone color to the tone signal from said keyboard section, said voltage controlled filter means being responsive to the pitch determining voltage signal from said keyboard section to set the cutoff frequency thereof to a low frequency value when said pitch determining voltage signal represents a higher note, and to set the cutoff frequency thereof to a higher frequency value than said low frequency value when said pitch determining voltage signal represents a note lower than said higher note;

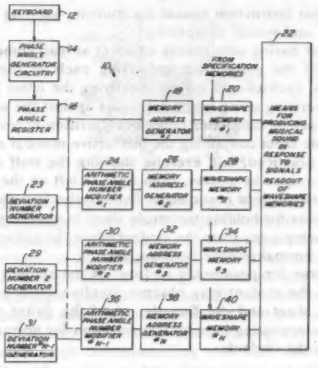
control voltage generating means coupled to said keyboard section and responsive to the trigger signal from said keyboard section to generate control voltage waveforms which vary as a function of time and which are coupled to said voltage controlled oscillator means and to said voltage controlled filter means to vary the oscillation frequency of said voltage controlled oscillator means and the frequency characteristics of said voltage controlled filter means, respectively; and

sound reproducing means coupled to said voltage controlled filter means for producing musical sounds.

3,978,755
FREQUENCY SEPARATOR FOR DIGITAL MUSICAL INSTRUMENT CHORUS EFFECT

Robert P. Woron, Allentown, Pa., assignor to Allen Organ Company, Macungie, Pa.

Filed Apr. 23, 1974, Ser. No. 463,218
Int. Cl.² G10H 1/04, 5/02
U.S. Cl. 84—1.24 **6 Claims**


KEYBOARD
PHASE ANGLE REGISTER
MEMORY ADDRESS GENERATOR
WAVE SHAPE MEMORY
MEANS FOR PRODUCING MUSICAL SOUND IN RESPONSE TO SIGNALS READOUT OF WAVE SHAPE MEMORIES
ARITHMETIC PHASE ANGLE NUMBER MODIFIER
DEVIATION NUMBER GENERATOR

1. An electronic musical instrument having at least two wave shape memory means for storing digital representations of musical voices, means for producing at least two musical sounds in response to wave shape signals read out of said memory means, apparatus for producing a frequency separation between the musical sounds produced in response to wave shape signals read out of said wave shape memory means, comprising:

means for generating a coded digital number corresponding to the frequency of a musical note in response to the actuation of a key of the electronic musical instrument;

means for generating a first memory address signal having a scan rate proportional to said coded digital number for reading wave shape signals out of one of said memory means at a rate proportional to said scan rate;

digital arithmetic means for changing the coded digital number output of said number generator by a predetemined value to produce a second coded digital number; and

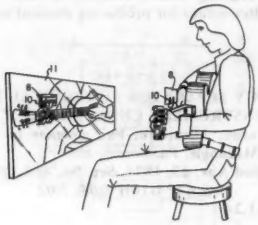
means for generating a second memory address signal having a scan rate proportional to said second coded digital number for reading wave shape signals out of another memory means at a rate proportional to the scan rate of said second memory address signal.

3,978,756

GUITAR INSTRUCTION SYSTEM

Jerome M. Feldman, Great Neck, N.Y., assignor to Hi-Tech Industries, Incorporated, Jamaica, N.Y.

Filed Aug. 25, 1975, Ser. No. 607,678
Int. Cl.² G09B *15/00*
U.S. Cl. 84—470 **10 Claims**



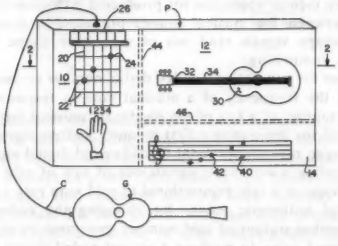
1. A guitar instruction system for students learning to play the guitar, said system comprising:
   a. a guitar having note indicia adjacent at least some of the frets of the guitar and underlying each of the guitar strings, each of said indicia specifying the letter note of the overlying string when depressed against the adjacent fret, each of said letter notes being written in reverse;
   b. a music sheet containing the instructive musical exercise to be practiced, said exercise showing the staff and the notes written in reverse, from right to left on the staff;
   c. a h der for said music sheet fixed to the fingerboard of the _ itar for holding the music sheet in upright position and facing away from the student when the guitar is held in the normal playing position; and
   d. a mirror for positioning in front of the student and in which the student may observe simultaneously both the music sheet and the fingerboard of the guitar with all indicia appearing in normal orientation for normal reading by the student.

3,978,757

INSTRUCTIONAL DISPLAY DEVICE OPERATED RESPONSIVE TO THE PLAYING OF STRINGED MUSICAL INSTRUMENTS

William T. Johnson, Jr., Winston-Salem, and James B. Joseph, Jonesville, both of N.C., assignors to Sightar Incorporated, Winston-Salem, N.C.

Filed Mar. 19, 1975, Ser. No. 559,791
Int. Cl.² G01G *1/02*
U.S. Cl. 84—485 R **4 Claims**



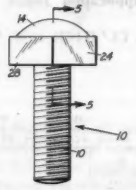
1. Display device for the instruction of stringed musical instruments of the type having a fingerboard comprising:
   a. a display panel having thereon a representation of a chord diagram with a plurality of intersecting vertical and horizontal lines representing strings and frets and a representation of at least the fingerboard portion of said stringed instrument with a plurality of intersecting vertical and horizontal lines representing strings and frets, said chord diagram and said fingerboard representation being selectively activated;
   b. a first light indicating means comprising indicator lamps mounted behind each of said line intersections on said chord diagram;
   c. a second light indicating means comprising indicator lamps mounted behind at least some of the line intersections on said fingerboard diagram;
   d. electrical means connecting the lamps in said first and second light indicating means with said musical instrument, said electrical means being activated responsive to the depression of the strings of said musical instruments to illuminate corresponding ones of said lamps; and
   e. said electrical means further comprising a circuit locking means selectively operable for causing at least one of said light indicating means to remain illuminated upon depression of further string combinations.

3,978,758

BOLT AND PROCESS OF FORMING SAME

William L. Bright, 0605 SW. Curry St., Portland, Oreg. 97201

Continuation of Ser. No. 459,945, April 11, 1974, abandoned.
This application May 29, 1975, Ser. No. 581,879
Int. Cl.² B21K *1/46*; F16B *23/00*
U.S. Cl. 85—9 R **3 Claims**



1. A bolt construction comprising,
   a. a body member having opposite ends,
   b. a head on one end of said body member having an undersurface,
   c. said body member having an unthreaded shank portion extending integrally from the undersurface of said head through a portion of the length of the body member,
   d. lateral projecting means on said unthreaded shank portion adjacent to the undersurface of said head,
   e. said body member having a threaded shank portion extending integrally from said unthreaded shank portion through the remaining portion of the body member,
   f. said projecting means extending laterally outwardly beyond the threaded surface of said threaded shank portion,
   g. an auxiliary bolt head having an upper surface,
   h. said auxiliary head having an axial opening larger in diameter than said threaded shank portion so as to receive the latter during construction of the bolt and smaller in diameter in at least a portion thereof relative to a lateral dimension of said projecting means,
   i. said auxiliary head having a non-rotatable securement on said body member with its upper surface in engagement against the undersurface of said bolt head by a forced penetration in an axial movement during bolt construction of said lateral projecting means into the portion of said auxiliary head that defines said axial opening in said auxiliary head,
   j. an inwardly swaged portion on a bottom portion of said auxiliary head around its axial opening gripping said body member and further locking said auxiliary head on said body member,
   k. said auxiliary head being of greater thickness than the length of said unthreaded shank portion so that said

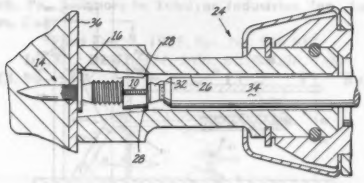
auxiliary head overlaps a portion of said threaded shank and said swaged portion grips in a portion of said threads, and a peripheral wrench-engaging surface on said auxiliary head arranged to receive a tool, whereby a turning force can be applied to the bolt.

3,978,759

CONTRACTIBLE GUIDE FOR STUDS

Andrew G. Bakoledis, Clinton, Conn., assignor to USM Corporation, Boston, Mass.

Filed Mar. 7, 1975, Ser. No. 556,299
Int. Cl.[2] B25D *17/00*
U.S. Cl. 85—10 E 2 Claims



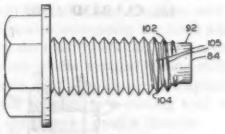
1. A muzzle-loading fastener assembly of the type drivable by a powder actuated tool comprising a fastener having a threaded trailing end portion, and a tubular combination guide and protector of deformable material strippable from covering relation with said threaded portion by radial removal therefrom, said guide-protector being resilient and formed with only one axial slit extending the entire distance between its extremities, and having an axial edge portion to be seized for effecting the removal, and having a plurality of external projections extending outwardly from said threaded trailing end portion and adapted to frictionally retain the fastener for loading in a muzzle bore of said tool.

3,978,760

SELF-THREAD FORMING THREADED FASTENERS AND BLANKS FOR MAKING SAME

Herman M. Muenchinger, South Dartmouth, Mass., assignor to Research Engineering & Manufacturing, Inc., New Bedford, Mass.

Continuation-in-part of Ser. Nos. 3,985, Jan. 19, 1970, Pat. No. 3,681,963, and Ser. No. 253,974, May 17, 1972, Pat. No. 3,803,889. This application Jan. 14, 1974, Ser. No. 432,957
Int. Cl.[2] F16B *25/00*
U.S. Cl. 85—47 7 Claims



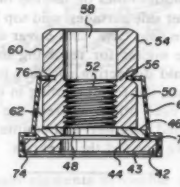
1. A thread-forming screw fastener comprising a threaded shank portion, a tapered thread-forming portion, and a lead portion, said thread-forming portion being intermediate the shank portion and the lead portion, the shank portion and the lead portion being cylindrical, the diameter of the lead portion being less than the diameter of the shank portion, the thread-forming portion diverging from the lead portion in a substantially conical configuration, the axis of a cone circumscribing the thread-forming portion being offset from and parallel with the axis of the lead portion whereby the thread-forming portion and the lead portion are eccentric relative to one another to provide a lobe on a portion of the periphery of the thread-forming portion, a thread-forming portion and the lead portion intersecting along a line which extends at an acute angle with respect to the axis of the lead portion whereby all planes transverse to the axis of the lead portion and extending through said line intersect both the lead portion and the thread-forming portion, the thread-forming portion having a partially formed thread with a substantially fully developed crest on the lobe, the thread on the thread-forming portion being a continuation of the thread on the shank portion.

3,978,761

FASTENER ASSEMBLY

Charles W. Sosinski, Linden, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed June 26, 1975, Ser. No. 590,629
Int. Cl.[2] F16B *31/02*
U.S. Cl. 85—61 4 Claims



1. A fastener assembly comprising: a flat washer having a first face arranged to be placed adjacent the surface about a threaded stud, a second face and a passage therethrough from said first face to said second face; an elastically deformable washer at least partially overlying said second face of said flat washer having a passage therethrough communicating with said passage of said flat washer; a nut at least partially overlying said elastically deformable washer having a threaded passage therethrough communicating with said passage in said elastically deformable washer; drive means coupled to and spaced apart from said nut; said drive means having a passage therethrough communicating with said passage of said nut; a shroud having a first end extending into the interspace between said nut and said drive means and a second end adjacent said first face of said flat washer; said shroud also having an exterior surface and an interior surface; and an annular ring on said interior surface adjacent said second end, said annular ring having an upper inclined surface in contact with the edge of said flat washer first face to hold said nut, said elastically deformable washer and said flat washer in assembly and as said nut is tightened on a threaded stud to cause said shroud second end to be enlarged and remove said annular ring from said edge of said first face and engage the outer periphery of said flat washer to permit said first face of said flat washer to engage the surface about the threaded stud upon which said nut is tightened.

3,978,762

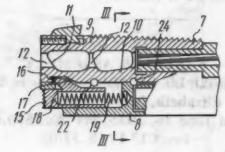
COMPENSATOR FOR SPORTING FIREARMS

Efim Leontievich Khaidurov, ulitsa Glagoleva 25, korpus 2, kv. 138, Moscow, and Vladimir Alexandrovich Razorenov, ulitsa Ponomareva 4a, kv. 51, Minsk, both of U.S.S.R.

Filed May 16, 1974, Ser. No. 470,556
Int. Cl.[2] F41C *21/18*; F41F *17/12*
U.S. Cl. 89—14 C 4 Claims

1. A compensator for sporting firearms, which utilizes the energy of the powder gases to reduce the jumping of the firearms at shooting, comprising: a case having top and bottom bars spaced a certain distance apart, said bottom bar being somewhat wider than said top bar, said case being open on its top and both sides; crosswise baffle plates to link said

bars, being tilted in the forward direction with respect to the longitudinal axis of the compensator so that when a shot is fired the gases are deflected upward, said baffle plates being trapezoidal in shape with the base upwards, and provided with holes for a bullet to pass therethrough, and also having a width exceeding that of said top bar; a cover attached to said case and embracing it over its bottom and both sides, the inner side surfaces of said cover serving as side deflecting surfaces of the



compensator; gas outlet holes on the top of the compensator, formed by said inner side surfaces, said top bar and said baffle plates; and wherein said case, said cover and said deflecting surfaces constitute means for resolving the pressure of the gases applied to said deflecting surfaces into horizontal and vertical components, the former acting in opposite directions and balancing out each other, whereas the latter are directed downward, are added together, and counteract the force that would tend to move upward the firearms.

3,978,763

BUFFER DEVICE FOR A SELF-LOADING SMALL ARM

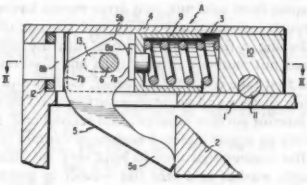
Paul Emile Francois Tellie, Saint-Etienne, France, assignor to Delegation Ministerielle pour l'Armement, France

Filed Apr. 14, 1975, Ser. No. 567,872

Claims priority, application France, May 21, 1974, 74.17551

Int. Cl.² F41D *11/12*

U.S. Cl. 89—198 **14 Claims**



1. A self-loading small firearm, comprising:

a. a receiver including a movable recoilable assembly which reciprocates longitudinally in the firearm; and

b. a buffer device, connected to the rear of said receiver, including a housing which is offset with respect to the axis of the firearm and connected at the same level as the rear of said receiver, an elastic device, connected within said housing, for absorbing part of the recoil energy of said movable assembly towards the end of a recoil stroke of said movable assembly, and means for transmitting the recoil energy of said movable assembly to said elastic device, said transmitting means including a step-down lever having a pivot pin connected within and in the transverse direction of said housing, a large arm protruding into said receiver and a small arm having a first cam, and a first stop connected within said housing and contacting said first cam, said small arm cooperating with said elastic device via said first cam and said first stop, wherein said pivot pin is located with respect to all points of contact of said first cam and said first stop such that the central axis (O) of said pivot pin is located outside but in the immediate vicinity of a predetermined maximum angle of friction (α) for the points of contact.

3,978,764

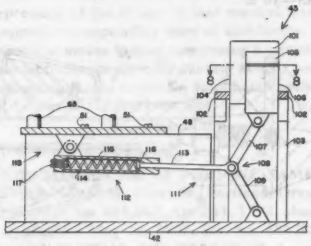
AUTOMATIC KEY DUPLICATING APPARATUS

George P. Patriquin, Gardner, Mass., assignor to Hudson Lock, Inc., Hudson, Mass.

Division of Ser. No. 394,500, Sept. 5, 1973, Pat. No. 3,865,011. This application Nov. 29, 1974, Ser. No. 528,222

Int. Cl.² B23C *1/16*

U.S. Cl. 90—13.05 **6 Claims**



1. A key duplicating machine comprising:

a base;

a sample vise for receiving and retaining a sample key to be duplicated;

a blank vise for receiving and retaining a blank key;

clamp means for opening and closing said sample vise means and said blank vise means, said clamp means comprising spring compensation means for variably yielding to closure forces on said clamp means so as to accommodate sample keys and key blanks of different thickness inserted in said vises, said clamp means further comprising toggle joint means for exerting closure forces on said vises; said toggle joint means comprising a pair of toggle links, one having one end secured to said base and another having one end secured to said vise means, and a pivot connection between the opposite ends of said one and another toggle links;

adjustable bias means for preloading said spring compensation means so as to provide an adjustable, predetermined initial contact pressure in said vise means; and

drive means for applying closure forces to said clamp means.

3,978,765

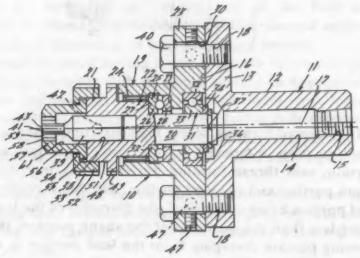
INTERNAL AND EXTERNAL CUTTING TOOL

John R. Scaduto, 14460 E. State Fair, Detroit, Mich. 48205

Filed July 7, 1975, Ser. No. 593,687

Int. Cl.² B23D *13/00*

U.S. Cl. 90—24 R **3 Claims**



1. In a cutting device for forming the internal and external surface of a workpiece, an adaptor having a supporting shank

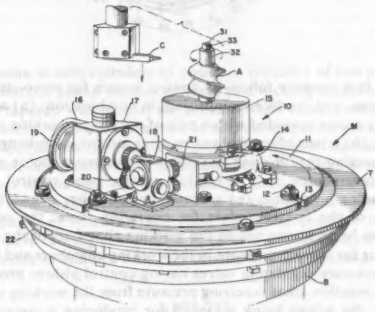
and a flange at one end having a face which slopes relative to the axis of the shank, a tool holder having a flange engaging said adaptor flange, a rotatable spindle supported within the holder and having a central aperture for receiving a tool, a tool for said aperture, a clamping element about said tool holder and threaded thereon for adjustably supporting a second tool which machines the outer surface of a workpiece, whereby the cutting device is advanced toward a workpiece and is driven in rotation thereby on an axis of the spindle for cutting both an internal and external surface simultaneously.

3,978,766

APPARATUS AND METHOD FOR MACHINING CONTINUOUS MIXER AGITATORS AND THE LIKE

Ambrose K. Brennan, Jr., and Norris H. Whisler, both of York, Pa., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Feb. 3, 1975, Ser. No. 546,817
Int. Cl.² B23D *5/04, 5/00;* **B23B** *3/00, 1/00*
U.S. Cl. 90—24.5 **8 Claims**



6. The method of machining a desired profile into a self-wiping, corotating, continuous mixer agitator, having opposite, convex, curved flanks, and opposite crests, comprising the steps of determining the size of the crests desired and determining the radius of curvature desired for the flanks, measuring the offset of the center for the radius of curvature of the flanks from the center of the agitator, providing an attachment for a vertical boring mill or lathe and the like, wherein the attachment includes a rotary indexing table, supporting the agitator to be machined on the rotary indexing table, positioning the center of the rotary indexing table a distance from the center of the vertical boring mill or lathe and the like a distance equal to the aforesaid offset, setting the rotary indexing table to a predetermined first setting to machine at least one flank of the agitator, and energizing the vertical boring mill or lathe and the like and substantially simultaneously therewith energizing the rotary indexing table to effect rotation of the rotary indexing table about its axis and also to effect rotation of the vertical boring mill or lathe and the like to thus obtain orbital motion of the agitator and movement of the agitator relative to a cutting tool to machine at least one flank of the desired profile therein.

3,978,767

AUTOMATIC CENTER HOLDING FIXTURE FOR AN ANNULAR WORKPIECE

Morris B. Levin, Chicago, Ill., assignor to Joel C. Levin, University City, Mo.

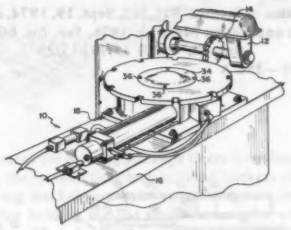
Filed July 11, 1974, Ser. No. 487,626
Int. Cl.² B23B *31/40;* **B23Q** *1/16*
U.S. Cl. 90—58 B **9 Claims**

1. Apparatus for gripping the interior surface of an annular opening in the center of a generally circular workpiece including in combination:

a baseplate having a shaft passing therethrough perpendicular to the plane of said plate and means responsive to the application of fluid pressure axially to move said shaft;

a set of generally arcuate gripping elements circularly positioned about said shaft and coaxial therewith, the elements being circumferentially spaced apart, said elements being slidable upon said baseplate radially of said shaft and each element having an interior radial camming surface and an exterior radial gripping surface, the combined gripping surface generally defining a cylinder, each element has oppositely opening slots on its peripheral ends spaced inwardly of the gripping surfaces,

spring bias means secured to said baseplate and positioned thereon in relation to said gripping elements normally to exert radially inward pressure on the elements tending to



contract the said elements to enable a decrease of the diameter of the cylinder defined by the combined gripping surfaces, the bias means comprise leaf spring means secured to said baseplate and extending between the opposed slots of adjacently positioned elements and bearing against the radially inward surfaces of said slots for exerting said radially inward pressure,

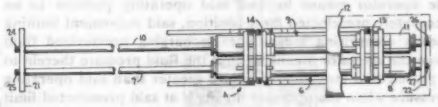
an actuating member secured to said shaft above the baseplate and movable in response to said shaft movement to cooperate with the camming surfaces on said elements for moving said elements to slide radially outwardly against the inward pressure of said spring bias means whereby to tend to increase the diameter of the cylinder defined by said gripping surfaces to enable said exterior gripping elements frictionally to engage the annular opening of a workpiece disposed on said baseplate.

3,978,768

TRANSFER FEED SYSTEM

Joseph D. Ringkamp, Clarks Summit, Pa., assignor to Acker Drill Company, Inc., Clarks Summit, Pa.

Filed Nov. 4, 1974, Ser. No. 520,895
Int. Cl.² F15B *11/18, 13/07*
U.S. Cl. 91—189 R **10 Claims**



1. Apparatus for transporting a work member over a predetermined path in such a manner as to minimize the required installation dimension of the apparatus, the apparatus comprising:

means capable of being coupled to the work member for transporting the work member over a portion of said path;

means for maintaining the work member in a coupling arrangement in which it is propelled by said transporting means;

further means capable of being coupled to the work member for transporting the work member over another portion of said path; and,

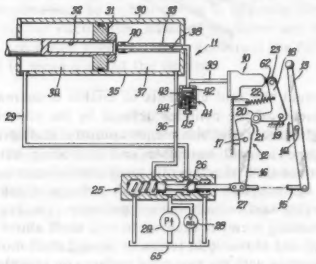
means for sequentially decoupling the work member from the coupling arrangement in which it is propelled by said transporting means and transferring the work member into a coupling arrangement in which it is propelled by said further transporting means, said transporting means and said further transporting means in at least one position thereof being capable of overlapping arrangement.

3,978,769

BUCKET POSITIONER KICKOUT SLAVE CYLINDER

Ralph R. Day, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 507,262, Sept. 19, 1974, abandoned.
This application Mar. 11, 1976, Ser. No. 665,943
Int. Cl.² F15B *13/16, 15/22*
U.S. Cl. 91—358 A **4 Claims**



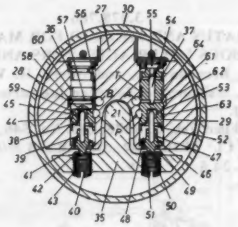
1. In a position control apparatus, a detent mechanism, spring means for biasing said detent mechanism, operator means responsive to fluid pressure to move to an operating position preselected to cause operation of the detent mechanism, and regulator means for limiting the fluid pressure to a preselected operating pressure at least equal to that required for operation of the detent mechanism by the operator means, the improvement comprising means for limiting movement of the operator means beyond said operating position to an accurately preselected limit position, said movement limiting means comprising means for discharging pressurized fluid from the operator means to limit the fluid pressure therein to a preselected maximum pressure greater than said operating pressure when the operator means is at said preselected limit position, said operator means comprising means defining a pressure chamber, a piston movable in said chamber, means defining an inlet to said chamber for delivering the pressurized fluid thereto for moving said piston, and spring means in said chamber biasing the piston against movement by the pressurized fluid, and said movement limiting means comprising outlet means for discharging pressurized fluid from said chamber when said piston moves to the preselected limit position, said outlet means including a passage through said piston and means forming a portion of said chamber means for maintaining said passage closed until the piston reaches said limit position.

3,978,770

PRESSURE FOLLOW-UP CONTROL MEANS FOR SERVO-STEERING SYSTEMS, AND THE LIKE

Günther Strauff, Kaarst, Germany, assignor to Langen & Co., Dusseldorf, Germany

Filed Dec. 2, 1974, Ser. No. 528,775
Claims priority, application Germany, Dec. 13, 1973, 2361893; Apr. 9, 1974, 2417194
Int. Cl.² F15B *9/10*
U.S. Cl. 91—372 **16 Claims**



1. In a pressure follow-up control system for servo-steering systems, and the like, comprising, in combination: (a) a fluid servo motor provided with a pair of separated working chambers; (b) a pair of control valves arranged for interchangeably connecting the working chambers of the servo motor with a pressure source and an outflow means, each control valve including a housing; (c) an activating member connected to both of the control valves for operating same, the control valves being connected to the working chambers of the servo motor for sensing pressure in the working chambers and forming pressure-regulating valves having control pistons provided with reaction areas receiving pressure from the working chambers, the valves being arranged for producing a connection between the pressure source and either one of the working chambers when the pressure on the associated reaction area falls below a predetermined value, and for increasingly throttling the connection between the pressure source and either one of the working chambers until the connection is blocked when the pressure in the working chamber increases beyond a predetermined limit, and connect the working chambers to the outflow means when the pressure increases further; and (d) springs arranged in the control valves for regulating same; the improvement in which the springs are prestressed relative to the pressure regulating valve at least in that positions of the valves which block the fluid connections, and the springs are self-supported by ends of the springs being arranged facing the activating member for permitting the entire spring force to be first received by the activating member alone, while below an activating force limit, at least one component of each of the springs is supported by the housing of the control valve, so that the bias on the one component increases, based on the activating force limit during a reduction of the activating force, and reaches a maximum when power-flow between the activating member and the associated regulating spring is interrupted.

3,978,771

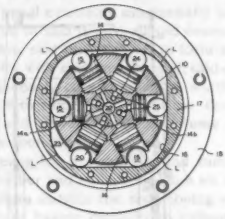
MECHANICAL PISTON RETENTION FOR FREE WHEELING

Thomas R. Burnight, and Donald A. Holtkamp, both of Battle Creek, Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Apr. 21, 1975, Ser. No. 570,335
Int. Cl.² F01B *13/06*
U.S. Cl. 91—491 **4 Claims**

1. A fixed displacement fluid pump or motor having a plurality of pistons reciprocable in a plurality of cylinders, means normally in driving or driven contact with said pistons, valve

means operable normally to cycle pressure fluid to said cylinders to operate said pistons and to prevent the pistons from being actuated out of contact with said driving or driven means, outwardly tapered wall means formed in each of said cylinders axially inwardly of the normal inner ends of the strokes of the respective pistons, locking means located on the respective pistons adapted to lockingly engage said tapered wall means in a free-wheeling condition of operation in which said pistons are actuated by inward momentum thereof only under certain conditions of relatively low fluid operating



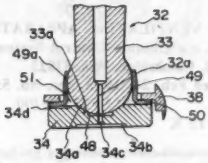
pressure in said cylinders to positions inwardly of one ends of the normal piston strokes wherein said locking means engage said tapered wall means, the pressure fluid conducted to said cylinders by said valve means in normal operation preventing the locking means from engagement with said tapered wall means, said pistons being actuated normally by said driving or driven means into positions closely spaced from the tapered wall means, said locked condition of said pistons under said condition of relatively low fluid operating pressure in said cylinders causing said pistons to be held continuously in positions out of contact with said driving or driven means.

3,978,772

PISTON SHOE FOR FLUID PRESSURE PUMP MOTOR

Takayuki Miyao; Hiroaki Maeda, both of Toyota, and Masanori Sato, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 19, 1974, Ser. No. 443,518
Claims priority, application Japan, Feb. 16, 1973, 48-19597
Int. Cl.² F01B *31/10*
U.S. Cl. 92—158 **6 Claims**



1. A piston shoe for fluid pressure pump motors of the piston type, comprising:

a substantially flat, plate-type shoe having a concave portion, for seating a convex portion of a piston rod, defined within one end surface therof and a substantially planar portion for contacting a sliding surface of a swash plate at the other end thereof;

a malleable holder capable of being worked so as to have a configuration corresponding to that of said convex portion of said piston and thereby support, and be caulked to, said convex portion of said piston rod at one end thereof, said holder being separate from, yet capable of being worked so as to have a configuration corresponding to that of said shoe and thereby be relatively immovably held in contacting relation with said shoe at the other end thereof; and

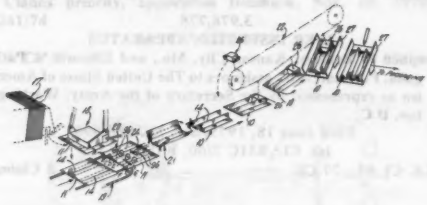
discharging means defined within said shoe for discharging the hydraulic fluid within a chamber defined by said shoe, said holder, and said piston.

3,978,773

PACKAGE LINER FORMING AND FEEDING APPARATUS

Albert Anthony Pinto, 6 Willows Lane, White Plains, N.Y. 10605

Filed Nov. 29, 1974, Ser. No. 528,424
Int. Cl.² B31B *1/04*; B31D *3/04*
U.S. Cl. 93—37 SP **3 Claims**



1. Apparatus for forming package liners from flat sheets and depositing the formed liner into inclined buckets of a continuously moving bucket conveyor comprising in combination a magazine for holding the flat sheets, means for creasing said sheets, means for individually removing said sheets from said magazine and feeding them through said creasing means, folding means for folding said sheets along said crease lines including plow elements and upper and lower conveyor belts for gripping the upper and lower surfaces of each sheet to draw the sheet past said plow elements, and overhead conveyor means including a plurality of heads spaced along the length thereof for gripping the formed liners and carrying the liners to the bucket conveyor, said overhead conveyor being arranged at an angle to the bucket conveyor and including means for positioning said heads to align said formed liners with said buckets, said creasing means dividing said sheets into panels and said folding means folding said sheets to form upright walls on either side of a panel,

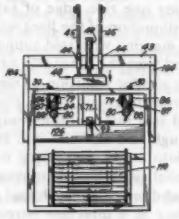
said heads of said overhead conveyor means including a body portion adapted to fit between the upright walls of the formed liner and jaws for clamping the liner walls between the body portion and the jaws.

3,978,774

TRAY FORMING MACHINE

Thomas B. Royal, Homestead, Fla., assignor to International Paper Company, New York, N.Y.

Filed Nov. 25, 1974, Ser. No. 526,826
Int. Cl.² B31B *1/46*
U.S. Cl. 93—51 HW **29 Claims**



1. An apparatus for forming a blank into a box having side walls, end walls and a pair of horizontally disposed shoulder panels each foldably connected to a respective one of said side walls, said apparatus comprising:

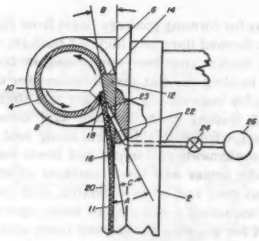
a. a frame;
b. an expandable mandrel mounted on said frame for reciprocating movement;
c. side wall forming means mounted on said frame for forming said side walls as said mandrel pushes said blank downwardly past said side wall forming means;
d. end wall forming means mounted on said frame;
e. means for expanding and contracting said mandrel; and
f. means for folding each of said shoulder panels.

3,978,775

LINER INSERTION APPARATUS

Stephen P. Buckley, Kansas City, Mo., and Edward N. Patigalia, Potomac, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 18, 1975, Ser. No. 588,090
Int. Cl.² B31C 5/00; B31B 1/12
U.S. Cl. 93—77 CL **5 Claims**



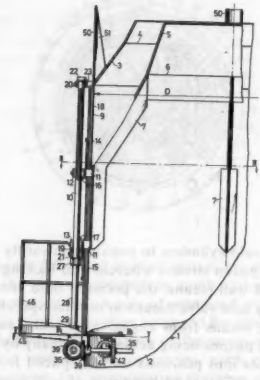
1. Apparatus for coiling and inserting a liner of flexible sheet material having a rough surface on one side into a hollow cylindrical container, comprising:
a support surface;
a longitudinally-slotted tube open at one end and supported on said support surface with its slot at the bottom parallel to and spaced from said support surface;
a wedge-shaped ramp on said support surface, with its thick edge abutting one side edge of said slot and forming a smooth continuation of the liner wall of said tube, and its knife edge merging with said support surface; said ramp being spaced from the other side edge of said slot to leave a clearance slot for insertion of said liner;
means for propelling said liner, placed on said support surface and said ramp with its rough surface facing said ramp, through said slot and into said tube, and forming said liner into a coil, comprisng means for producing a first tangential air jet located midway between the ends of said slot and directed through said ramp and against said rough surface in a direction perpendicular to said slot; and
means for inserting said coil into a hollow cylindrical container, supported adjacent to and in axial alignment with said tube, comprising means for producing a second tangential air jet located near the open end of said tube and directed through said ramp and against said round surface at an acute angle to said slot.

3,978,776

CHIMNEY FOR EXHAUST GAS HAVING MEANS FOR THROTTLING A FLOW OF EXHAUST GAS

Robert Kausche, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Nov. 19, 1974, Ser. No. 525,086
Claims priority, application Switzerland, Nov. 23, 1973, 16507/73
Int. Cl.² F23L 17/08
U.S. Cl. 98—58 **9 Claims**



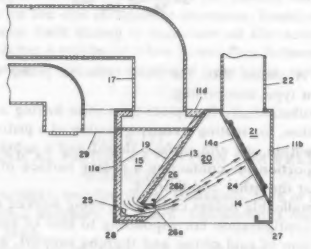
1. An exhaust gas chimney having an outlet end, a first upwardly conveying outflow funnel at said outlet and having an outlet of predetermined size for passage of a flow of exhaust gas therethrough, a second upwardly converging funnel coaxially within said first funnel of smaller size than said first funnel, and means for moving said funnels relative to each other for throttling a flow of exhaust gas between said funnels, said funnels being movable into a closed position relative to each other wherein said funnels adjoin each other to form an outlet of a size smaller than said outlet of said first funnel.

3,978,777

VENTILATING APPARATUS

Louis A. Nett, c/o Climate Control Systems, Inc., P.O. Box 199N, R.R. 1, Cambridge, Wis. 53523

Filed Feb. 24, 1975, Ser. No. 552,228
Int. Cl.² F23J 11/00
U.S. Cl. 98—115 K **8 Claims**



1. Ventilating apparatus for ventilating a room, comprising:
a. an exhaust hood having front, side and rear walls,
b. means extending substantially across the front of said exhaust hood for introducing tempered air adjacent to

and downwardly and substantially evenly across the front of said exhaust hood,

c. an interior wall disposed within said exhaust hood and which with said walls forms a smooth walled intake chamber and a fume collection and exhaust chamber within said exhaust hood, said intake chamber being separate from said means for introducing tempered air,

d. air intake means for drawing ambient air from outside the room being ventilated and forcing such air under pressure into said intake chamber,

e. a throat panel extending substantially along the length of the bottom of said interior wall,

f. a deflector panel extending substantially along the length of the bottom of said front wall and positioned in spaced relation below said throat panel to form a longitudinally extending slot with said throat panel, said deflector panel being continuously curved along its width to deflect air introduced into said intake chamber through said slot rearwardly and upwardly into said fume collection and exhaust chamber, and

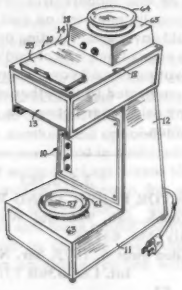
g. exhaust means for drawing air and fumes out of said exhaust chamber and exhausting such air and fumes into the atmosphere outside the room being ventilated, said exhaust means having capacity to exhaust more air by volume than introduced into said intake chamber by said air intake means.

3,978,778

BEVERAGE-MAKING APPARATUS

Melvin F. Roberts, Chicago, Ill., assignor to Bloomfield Industries, Inc., Chicago, Ill.

Filed Feb. 5, 1975, Ser. No. 547,101
Int. Cl.² A47J *31/00*
U.S. Cl. 99—281 **8 Claims**



1. A beverage making apparatus including

a. a housing for said apparatus providing a base portion, a hollow upright standard, and an upper chamber,

b. a wall member within said upper chamber defining a liquid basin and a dry compartment disposed in side-by-side relation, with both having open communication with said hollow standard,

c. a removable liquid container supported by said dry compartment within said upright standard between said base portion and said upper chamber,

d. a removable cover for said liquid container closing the same from said dry compartment of said upper chamber,

e. means carried by said cover for delivering liquid from said liquid basin through said dry compartment into the bottom of said liquid container,

f. means carried by said cover for electrically heating the liquid in said liquid container,

g. means carried by said cover for dispensing heated liquid by siphon action from said liquid container through said dry compartment to a remotely located dispensing head, and

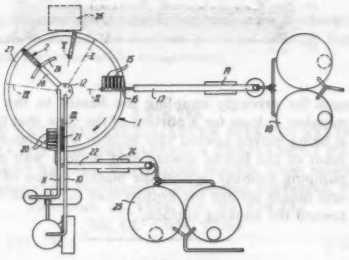
h. means for latching said cover on said liquid container and for hermetically sealing the same thereto.

3,978,779

APPARATUS FOR PREPARING EDIBLE PRODUCTS

Gunnar Christian Petersen, Odense; Ole Thisgaard, Hjallese, and Steen Wilg, Naesby, all of Denmark, assignors to Dansk Andels Aegexport, Copenhagen, Denmark

Filed Nov. 24, 1975, Ser. No. 634,708
Claims priority, application Denmark, Nov. 29, 1974, 6241/74
Int. Cl.² A47J *43/20*
U.S. Cl. 99—353 **14 Claims**



1. Apparatus for preparing an edible product including a cylindrical product core and an outer cylindrical shell of coagulated egg-white mass, said apparatus comprising:

a plurality of vertically oriented cylindrical moulds, each formed by an integral cylindrical tube open at both ends,

a bottom plug axially displaceable within each mould in sealing engagement with the inner mould surface,

means for cyclically moving said moulds through a plurality of successive stations including a station for inserting a core member in each mould, a station for withdrawing the core member from the mould, at least one station for supplying liquid egg-white mass to the annular space defined between the inner wall of the mould and the core member, and supplying a material to form said product core to the space formed by the core member, and a station for withdrawing finished products from said mould,

means for heating said moulds and means for subsequently cooling the moulds,

lifting means adapted to move each bottom plug upwardly through at least the majority of the height of the associated mould for permitting withdrawal of the finished product from the top of the mould,

means adapated to move each bottom plug back to its lowermost position in the associated mould, and

applicator means for applying a measured amount of a lubricating agent onto the inner surface of each mould after the associated bottom plug has been lifted and the product withdrawn from the mould.

3,978,780

COOKING UTENSIL

Christopher I. Venelin, 608 Larkspur Ave., Corona Del Mar, Calif. 92625

Filed Aug. 15, 1975, Ser. No. 605,048
Int. Cl.² A47J *37/10*
U.S. Cl. 99—422 **11 Claims**

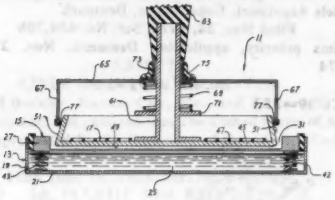
1. A cooking utensil comprising:

a receptacle for batter, said receptacle having a bottom wall and an open top;

a pumping member at least partially within said receptacle and mounted for movement toward and away from said bottom wall;

resilient means for resiliently urging the pumping member away from the bottom wall;

a heater having a cooking surface, said heater being sized to be received in the receptacle through the open top thereof and moved toward the bottom wall to bring the cooking surface into contact with the batter; and



means for drivingly coupling the heater to the pumping member at least for a portion of the time that the heater is being moved toward said bottom wall whereby movement of the heater toward said bottom wall drives the pumping member against the biasing action of the resilient means toward the bottom wall to elevate the batter toward the cooking surface.

3,978,781

PANCAKE COOKING MACHINE

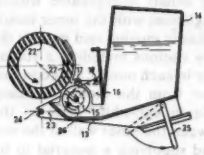
Pierre Tanguy, Dijon, France, assignor to Etud, Dijon, France

Filed May 24, 1974, Ser. No. 473,227

Claims priority, application France, June 1, 1973, 73.20016

Int. Cl.² A21B *1/48*

U.S. Cl. 99—423 **33 Claims**



1. A machine for cooking a cooking mix comprising:

a. a tank for containing the mix,

b. a roller, partly immersed in the tank, for entraining a film of the mix thereon,

c. a rotary cooking drum, including means for internally heating said cooking drum,

d. means for rotating said roller and said drum,

e. a retaining means positioned closely adjacent said roller for at least partially retaining the film of mix on the roller thereby forming a bead of the mix adjacent said retaining means, said retaining means being a stable bar,

f. said cooking drum positioned so as to enable said bead to coat said drum with a film of the mix, and

g. means to interrupt the coating of the cooking drum.

3,978,782

HORS D'OEUVRES OVEN

John M. Werling, 209 E. 36th St., Apt. 3, Kansas City, Mo. 64111

Filed May 16, 1975, Ser. No. 578,134

Int. Cl.² A47J *27/00*

U.S. Cl. 99—446 **11 Claims**

2. A cooking device comprising:

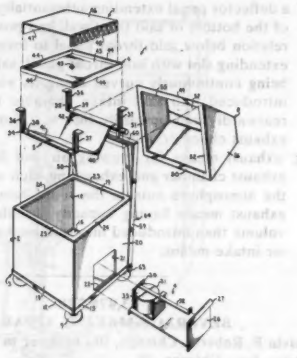
a. a support structure;

b. a housing mounted on said support structure and having walls defining an open top chamber, certain of said chamber defining walls having an upper edge;

c. means positioned in said housing for heating the chamber;

d. means positioned in said housing and above said chamber heating means for supporting food items;

e. means positioned in said housing and between said chamber heating means and said means for supporting food items for receiving and retaining food drippings;



f. a cover for said housing;

g. a pair of elongated arms each having a lower end pivotally mounted on said support structure;

h. means pivotally mounted on said pairs of arms for supporting said cover and including portions engageable with the upper edge of one wall of said chamber defining walls during pivoting of said cover supporting means; and

i. a handle connected to the other end of said pair of arms for moving said cover between a closed position and an open position.

3,978,783

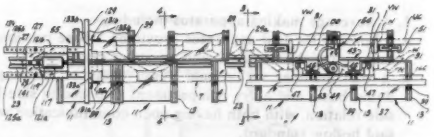
APPARATUS FOR FABRICATING WOOD STRUCTURES

Walter G. Moehlenpah, 906 Old Warson Road, Ladue, St. Louis County, Mo. 63124

Filed June 4, 1975, Ser. No. 583,650

Int. Cl.² B30B *15/16*

U.S. Cl. 100—53 **15 Claims**



6. Apparatus for fabricating wood structures, such as a truss having upper and lower chord members spaced from one another and a plurality of web members extending between the chord members, said apparatus comprising means for supporting said wood members in position for having nailing plates driven thereinto from above and below at the intersections of the wood members to form said truss, said supporting means comprising a frame extending longitudinally of the truss and a plurality of supports movable longitudinally with the frame for supporting the wood members at each of said intersections, said apparatus further comprising means for driving said nailing plates into said wood members, means for

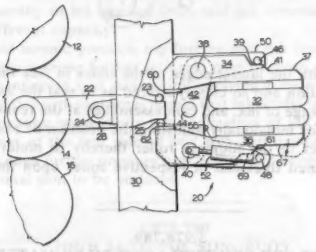
holding said wood members on said supports in a desired position for being secured together by said nailing plates, and means movable between an operating position for holding at least one end of said upper and lower chord members in desired spaced relation and for holding an end web member in a selected position relative to said one ends of said chord members during fabrication of the truss and a retracted position to facilitate lifting of said truss generally vertically for removal of the truss from the apparatus.

3,978,784

CALENDAR CONTROL SYSTEM

Rodney Harold Bryce, Lachine; Alfred Edel, Montreal, and Adu Randpalu, LaSalle, all of Canada, assignors to Dominion Engineering Works, Limited, Lachine, Canada

Filed Nov. 11, 1974, Ser. No. 522,450
Int. Cl.² B30B *3/04*
U.S. Cl. 100—170 **12 Claims**



1. Actuating apparatus selectively operable to provide force output in at least two optional directions, comprising:

a primary actuator having a uni-directional output; first linkage means operable in a first mode for connecting said primary actuator with a force output member for working movement in one said optional direction; second linkage means connecting said actuator with a force output member and operable in a second mode for working movement in another said optional direction; and

a secondary actuator connected in positioning relation with said first and said second linkage means to provide selective positioning movement thereto for selectively connecting said primary actuator for actuating a selected said linkage means and said force output member in a respective direction, and to position the other said linkage means in reaction providing relation with said primary actuator.

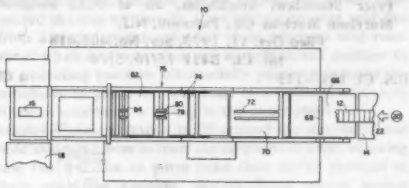
3,978,785

STACKING AND BUNDLING MACHINE

Willis J. Stapp; Norman P. Crowe, and Edwin A. Molitor, all of Clermont City, Ohio, assignors to Multifold-International, Inc., Milford, Ohio

Division of Ser. No. 476,578, June 5, 1974, Pat. No. 3,907,129. This application June 23, 1975, Ser. No. 589,545
Int. Cl.² B30B *15/30*
U.S. Cl. 100—215 **7 Claims**

1. In a machine for bundling flat articles in a compressible stack, a stack compressing assembly which comprises a horizontal elevator platform, means for delivering the stack of articles onto the elevator platform, means for advancing the elevator platform to a stack delivery level, a stack compressor frame mounted for up and down movement adjacent the stack delivery level, an upright crank arm pivotally mounted at a lower end of the stack compressor frame, a stack engaging flap attached to an upper end of the crank arm, means for swinging the crank arm between a retracted position in which the flap is free of the stack and an advanced position in which the flap overlies the stack on the elevator platform at discharge level and the flap is substantially horizontal, means for lowering the stack compressor frame to cause the flap to



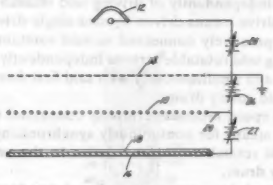
engage and compress the stack, and means for discharging the stack from between the elevator platform and the flap in a horizontal direction while compressed.

3,978,786

COPY AND REUSABLE MASTER MAKING SYSTEM APPARATUS FOR PREPARING A PERMANENT IMAGE

Curt Robert Raschke, Warrensville Heights, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Nov. 15, 1974, Ser. No. 524,232
Int. Cl.³ G03G *15/00*
U.S. Cl. 101—114 **3 Claims**



1. An apparatus for preparing a permanent image on a carrier sheet confirming to an optical image, comprising:

an electrically conductive platen adapted to support an image receiving carrier member;

a corona source adapted to spray ions toward said image receiving member;

a corona modulating screen disposed between said corona source and said image receiving member;

a toner carriage screen positioned between said modulating screen and platen, said screen having a high resolution of small openings for holding toner particles clinging thereon and bridging said openings, said screen having a conducting core with an insulating coating; and

means for impressing a first field potential between the corona source and said modulating screen in a direction to impel ions toward said platen, a separate second field potential between said modulating screen and said toner carriage screen of complementary direction to said first field, and a separate third field potential between said toner carriage screen and said platen of complimentary direction to said second field for causing said corona to emit ions of a charge to be attracted to said platen;

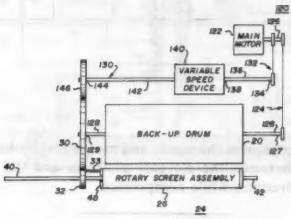
whereby toner particles on said carriage screen struck by corona ions passing through neutralized portions of said modulating screen will be ionized to a charge which will cause them to be propelled by said field toward said platen.

3,978,787

DRIVE MEANS FOR CYLINDRICAL SCREEN PRINTER

Thomas Marino, Totowa Boro.; John Kreeft, Wyckoff, and Peter Stanislaw, Stockholm, all of N.J., assignors to Morrison Machine Co., Paterson, N.J.

Filed Oct. 11, 1973, Ser. No. 405,418
Int. Cl.² B41F 15/10, 5/14
U.S. Cl. 101—115 4 Claims



1. A screen printing machine comprising:
a frame;
a rotary drum supported by said frame and mounted on a shaft having first and second shaft portions extending from opposite ends of said drum;
a plurality of rotary screen assemblies carried by said frame and distributed circumferentially about said rotary drum, each of said assemblies including a rotatable screen;
a single drive mechanism and a first drive means connected to said single drive mechanism for driving said rotary drum independently of driving said rotatable screens;
second drive means driven by said single drive mechanism and operatively connected to said rotatable screens for driving said rotatable screens independently of said rotary drum and simultaneously with said first drive means driving said rotary drum;
variable speed means operatively connected to one of said drive means for continuously synchronizing the velocity of said rotatable screens relative to the velocity of said rotary drum;
said second drive means including a sun gear freely rotatably mounted on said first shaft portion of said rotary drum, a drive gear, second linkage means interconnecting said single drive mechanism and said drive gear, the teeth of said drive gear engaging corresponding teeth of said sun gear, and a screen gear connected to each of said rotatable screens, the teeth of said screen gears engaging corresponding teeth of said sun gear.

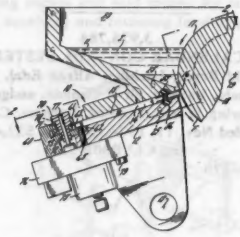
3,978,788

INK METERING ASSEMBLY FOR PRINTING PRESS

Bert Cappel, Offenbach-Bieber; Siegfried Schuhmann, Offenbach, and Klaus Wolf, Neu-Isenburg, all of Germany, assignors to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany

Filed May 16, 1975, Ser. No. 578,039
Int. Cl.² B41F 31/02
U.S. Cl. 101—363 9 Claims

1. In an ink fountain the combination comprising a frame defining a horizontal slot having parallel walls, a fountain roller rotatable in the frame adjacent the slot, a metering assembly mounted in the slot and having a presented front edge arranged in abutting relation with the surface of the roller, the frame being shaped to support a body of ink adjacent the metering assembly so that a film of ink is formed on the roller by the assembly as the roller is rotated, the metering assembly being in the form of a series of rectangularly shaped slides arranged side by side in coplanar relation with their laterial edges lying closely adjacent one another so that the presented front edge is substantially continuous, the lateral edges of the slides adjacent the front ends thereof being formed with registering notches of uniform size, the registering notches being occupied by slightly oversized buttons of resilient sealing material, the resilience of the oversized buttons tending to spread the slides slightly away from one another to establish uniform spacing between them, vertical end plates at the respective ends of the assembly for clamping the slides together with the buttons of resilient material in compression with the lateral edges of the slides in free relatively sliding relation and so closely spaced as to seal the assembly against leakage of ink, and cam assemblies at the rear ends of the slides for individually adjusting the position of each slide with respect to the fountain roller thereby to meter ink in predetermined thickness in respective zones upon the fountain roller.

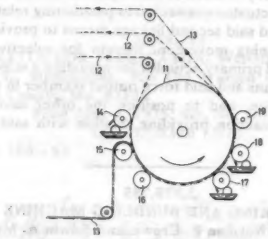


3,978,789

PROCESS FOR PRINTING LONG PILED MATERIAL

Peter Fennekels, Kempen-Huls; Sieghard Helfert, Kempen, and Ernst Waltmann, Krefeld, all of Germany, assignors to Girmes-Werke AG, Germany

Continuation of Ser. No. 351,874, April 17, 1973, abandoned.
This application Oct. 7, 1974, Ser. No. 512,865
Claims priority, application Germany, Apr. 18, 1972, 2218732; May 10, 1972, 2222838
Int. Cl.² B41M 1/18
U.S. Cl. 101—211 3 Claims



1. A process for printing pile fabric to produce fabric with the natural appearance of animal skins, said printed fabric having areas of different color intensity and shading thereon; characterized by the steps of
a. maintaining a fabric web with a pile surface under longitudinal tension;
b. passing said web through a first ink applying zone defined by a plurality of spaced ink retention areas of different capacity according to the animal skin to be imitated;
c. applying the ink from said plurality of ink retention areas to the back side of said web;
d. passing said web through a pressure nip to force said applied ink upwardly through the individual piles of said web in the areas where ink was applied to the back side of said web;

e. said pressure nip forcing said applied ink into said piles from the back side of said web according to the quantity of ink applied from said ink retention areas of different capacity;

f. passing said web through a second ink applying zone defined by a plurality of spaced ink retention areas of different capacity according to the animal skin to be imitated;

g. said ink retention areas in said first and second zones registering in some cases and not in others according to the animal skin to be imitated;

h. applying the ink from said plurality of ink retention areas in said second ink applying zone to the back side of said web;

i. passing said web through a second pressure nip to force said applied ink from said second ink applying zone upwardly through the individual piles of said web in the areas where ink was applied to the back side of said web;

j. said second pressure nip forcing said applied ink into said piles from the back side of said web according to the quantity of ink applied from said ink retention areas of different capacity;

k. said second pressure nip forcing said ink from said first applying zone further into said piles in those areas of ink retention in said second ink applying zone which are in registry with said areas in said first ink applying zone; and

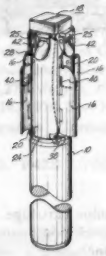
l. repeating sequentially the application of ink to selected areas of the rear side of said web and passing said web through further pressure nips as required according to the animal skin to be imitated.

3,978,790

HIGH ALTITUDE SONOBUOY

John Robert Sandelius, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 23, 1975, Ser. No. 625,231
Int. Cl.² F42B *25/02*
U.S. Cl. 102—4 **1 Claim**



1. In a sonobuoy, the improvement for adapting the sonobuoy for high altitude deployment comprising:

a. a rotatable collar rotatably carried by the sonobuoy;

b. a plurality of rotovanes hingedly carried by said rotatable collar, said rotovanes being movable between a stored position adjacent the sonobuoy and an operating position wherein said rotovanes and said rotatable collar will revolve from wind pressure when the sonobuoy is falling in the atmosphere, said rotovanes being so shaped as to lie close adjacent the sonobuoy such that the sonobuoy will fit in a sonobuoy launching and storage tube with the rotovanes in the stored position and provide a lifting force on the sonobuoy when the rotovanes are rotated by wind pressure in the operating position;

c. a plurality of fin retaining leaves being shaped to fit between said rotovanes and the sonobuoy and be held in such position by said rotovanes when said rotovanes are in their stored position, said fin retaining leaves having hinge means carried adjacent one edge of said rotovanes when said fin retaining leaves are being held in place between said rotovanes and the sonobuoy;

d. a plurality of fins carried by said hinge means of said fin retaining leaves, said fins having springs operatively connected thereto to provide a spring bias to urge said fins from a stored position folded close adjacent said rotovanes when said rotovanes are in their stored position to an operating position substantially perpendicular to the sonobuoy to guide the sonobuoy in a ballistic trajectory when th sonobuoy is falling in the atmosphere;

e. retaining means shaped to fit around the sonobuoy and hold said rotovanes in their stored position while allowing said fins freedom to move from their stored position to their operating position, said retaining means having release means which when actuated will allow said retaining means to release said rotovanes from their stored position and move to their operating position; and,

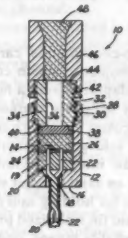
f. altitude responsive means carried by the sonobuoy and operably connected to said release means of said retaining means, said altitude responsive means being set to operate said release means at the preselected altitude where it is desired that ballistic fall of the sonobuoy end and slowed descent by autorotation of said rotovanes begins.

3,978,791

SECONDARY EXPLOSIVE DETONATOR DEVICE

Virgil F. Lemley, Escondido; Glenn E. Seay, La Jolla, and Perry B. Ritter, Encinitas, all of Calif., assignors to Systems, Science and Software, La Jolla, Calif.

Filed Sept. 16, 1974, Ser. No. 506,119
Int. Cl.² F42B *3/12*; **F42C** *19/12*
U.S. Cl. 102—28 R **14 Claims**



1. A low voltage hot wire detonator device containing all secondary type explosive and comprising:

a body having a closed end and an internal chamber containing a donor secondary explosive therein, said body having internal threads in the open end opposite said closed end;

hot wire means including electrical conductors extending outwardly through an aperture in said body, said hot wire means being adjacent said donor explosive and adapted to cause ignition thereof in response to a low voltage current being applied to said conductor;

an impactor disc positioned within the chamber of said body adjacent said donor explosive so as to generally cover the same;

barrel means having external threads for engaging the internal threads of said body, said barrel means having an elongated bore defining an air gap and a generally flat annular shoulder for contacting said impactor disc, rotation of said barrel means in a first direction relative to said body causing said barrel means to be moved toward said closed end and bring said impactor disc into contact with said donor explosive so as to tightly confine the same;

the central portion of said impactor disc inside of said annular shoulder being sheared therefrom in response to deflagration of said donor explosive;

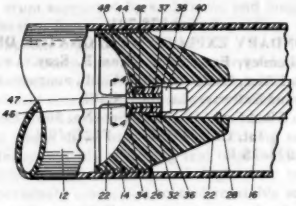
said impactor disc being of a thickness and material so that the ratio of the thickness of said sheared central portion to the outer diameter of the sheared central portion is within the range of about ½ to about ⅝, said sheared central portion being accelerated down said bore as a unitary piece, said ratio thereof substantially preventing tumbling of the sheared central portion during travel, thereby preventing substantial escape of explosive gases between said central portion and the wall of said bore.

3,978,792

PROJECTILE-TO-CARTRIDGE CASE ATTACHMENT

Ralph F. Campoli, Mine Hill, N.J.; Edwin G. Steiner, Waterloo, Iowa; Dennis L. Purtilo, Waterloo, Iowa, and Thomas A. Lynch, Waterloo, Iowa, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 25, 1975, Ser. No. 571,672
Int. Cl.² F42B 5/02
U.S. Cl. 102—38 2 Claims



1. A projectile-to-combustible cartridge case attachment for a fin-stabilized projectile which comprises:

a cartridge case adapter having a hollow cylindrical section which integrally supports thereon a plurality of equally spaced, radial gusset members seated on the fin hub of said projectile, said gusset members connected at their base ends by an integral, cylindrically shaped locking member having an axial adapter sleeve bore therein; and

self-locking means for holding said cartridge case adapter to the fin hub of said fin stabilized projectile which includes;

first axially insertable means, operatively disposed within said locking member, for holding said locking member against the fin hub, which includes;

a retainer sleeve having a first shoulder end which abuts against said locking member, a second slotted forward end having a second shoulder thereon, said sleeve having an axial sleeve bore therein and a retainer sleeve annular groove which communicates with said sleeve bore, and

second axially insertable means, operatively positioned within said first axially insertable means, for preventing said first insertable means from being withdrawn from said locking member and positively locking said cartridge case adapter to said projectile, which includes;

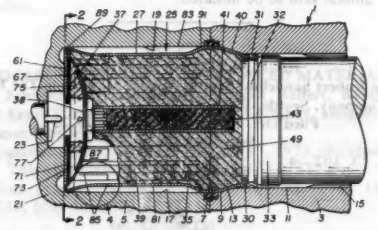
a tubularly shaped retainer plug having an annularly positioned shoulder on one end of said plug, said plug being forcibly disposed in said axial sleeve bore so that the shoulder of said plug fits into said retainer sleeve annular groove, said cartridge case adapter being mounted over said fin hub with said gusset members being seated on said fin hub and said slotted sleeve forward end being operatively positioned within said adapter sleeve bore into a fin hub axial bore and annular fin hub groove, said slotted forward shoulder end expanding into said fin hub annular groove, said retainer plug being forced into said retainer sleeve axial bore with said annular plug shoulder engaging said retainer sleeve annular groove, thereby trapping said retainer sleeve slotted second shoulder end in said fin hub groove and locking said cartridge case adapter to said projectile.

3,978,793

MUZZLE-EXPELLABLE CARTRIDGE

William S. McLennan, Wharton, N.J., and George C. Potts, deceased, late of Philadelphia, Pa., by Mary P. Potts, executrix, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 30, 1975, Ser. No. 591,802
Int. Cl.² F42B 5/02
U.S. Cl. 102—38 7 Claims



1. A muzzle-expellable cartridge, adapted to be fired in the chamber of a gun barrel, comprising:

a cartridge case including a side wall of sheet material adapted to fit within said chamber, said case being open at its forward end and having a transverse wall at its rear end;

a projectile releasably attached to said open end;

a main propellant charge disposed within said case in front of said transverse wall for propelling said projectile from said case and through said barrel;

an auxiliary propellant charge located behind said transverse wall for propelling said case forwardly through said barrel after the propulsion of said projectile therefrom;

means for initiating said propellant charges; and

means for providing spaces between said side wall of said case and said chamber and for venting a portion of the gases generated by said main projectile charge to said spaces, to collapse said side wall and thereby facilitate removal of said case from said chamber, the last-named means comprising a series of external longitudinal flutes and intermediate ribs formed in and extending along the major portion of the length of said side wall, and apertures in said flutes for venting said gases through said side wall.

3,978,794

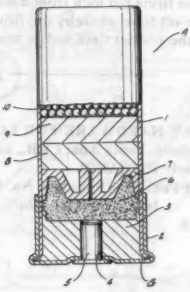
BASE WAD FOR SHOTSHELLS

Giuseppe G. Fiocchi, Mandello Lario Como, Italy, assignor to Giulio Fiocchi, S.p.A., Lecco, Como, Italy

Continuation-in-part of Ser. No. 429,094, Dec. 28, 1973, abandoned. This application Dec. 5, 1974, Ser. No. 529,610

Int. Cl.² F42B 7/08

U.S. Cl. 102—42 R 11 Claims



1. A shotshell base or under powder wad having a unitary, integrally formed body consisting essentially of a normally soft, relatively low molecular, non-linear, non-copolymerized thermoplastic and a naturally occurring mineral, said body having uniform consistency throughout its extent.

3,978,795

RETAINING RING APPARATUS

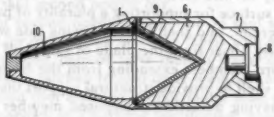
Manfred Strunk, Neuenrade; Heinz Kroschel, Troisdorf-Sieglar, and Alfred Voss, Cologne, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Division of Ser. No. 376,278, July 5, 1973, abandoned. This application Sept. 16, 1974, Ser. No. 506,338

Claims priority, application Germany, July 5, 1972, 2232955

Int. Cl.² F42B 13/10

U.S. Cl. 102—56 SC 7 Claims



1. Apparatus comprising a hollow charge projectile including a projectile housing, a hollow explosive charge, and a metallic lining within the housing, a tip portion secured to the housing, a retaining ring including a ring-shaped member and resilient tongue members having one end thereof joined to the ring member, the tongue members being bent out of the plane of the ring member and extending at least approximately in the peripheral direction of the ring member, and the retaining ring being arranged for securing the position of the metallic lining within the housing, the retaining ring being disposed in a groove of the tip portion of the projectile.

3,978,796

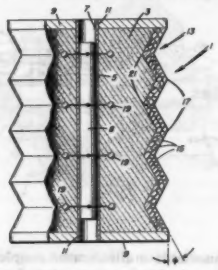
FOCUSED BLAST-FRAGMENT WARHEAD

Emory E. Hackman, Arlington, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 30, 1968, Ser. No. 725,546

Int. Cl.² F42B 13/18, 13/10

U.S. Cl. 102—67 4 Claims



1. A fragmentation warhead exhibiting focused blast properties, comprising

a body of explosive material having a generally cylindrical shape with annular conical corrugations radially and regularly disposed over its surface, said corrugations defining troughs therebetween,

a projectile surrounding the cylindrical corrugated surface of the body, said projectile having its surface conforming to the shape of the body surface,

an axial channel disposed within the body,

a liner mounted in the channel,

point initiation detonators embedded in the body, one of the detonators being disposed in confronting relation to each of said troughs whereby, upon initiation of the detonators, explosive of the body will produce shock waves that will act on the walls of the corrugations for fragmenting the projectile and projecting the fragments thereof in a direction normal to the axis of the warhead,

arming means mounted in the liner and connected to said detonators, and

end plates secured to the liner and to the projectile at opposite ends of the body for closing the ends of said body, said end plates partially confining gaseous explosion products produced upon detonation of the body, explosion of the body producing a focused blast characterized by increased metal projection and enhanced blast properties.

3,978,797

RADIOMETRIC TARGET DETECTION DEVICE

William W. Harrington, China Lake, and Frederick C. Alpers, Riverside, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 28, 1971, Ser. No. 142,837

Int. Cl.² F42C 13/06, 11/00

U.S. Cl. 102—70.2 P 1 Claim

1. In a radiometric target detecting device for guided missiles the combination comprising:

a. antenna receiving means including two antennas with one positioned just ahead of the other to form two fanshaped receiving patterns for receiving black body radiation and reflected sky radiation from an area of suspected targets,

b. a radiometric type receiver,

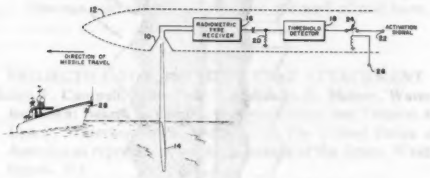
c. switch means alternately connecting said antennas to said receiver,

d. said receiver including a modulation amplifier that amplifies and passes only modulated signals and a phase sensi-

tive detector coupled to said modulation amplifier for detecting any signal modulation and generating an output signal in response to a target being present in one antenna pattern,

e. a delay circuit coupled to the output of said phase sensitive detector,

f. an inverter circuit coupled to the output of said phase sensitive detector for providing an inverted form of the output signal from said phase sensitive detector,



c. g. a monostable multivibrator coupled to said delay circuit for producing a gating pulse of a predetermined time duration in response to the delayed output signal from said delay circuit,

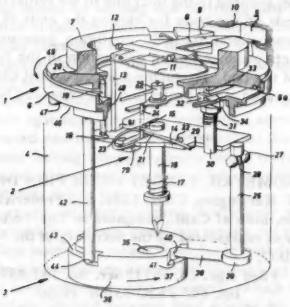
h. a gated amplifier having a first input coupled to the output of said inverter circuit and a second input coupled to the output of said monostable multivibrator and being responsive to generate a warhead actuating signal when the inverted signal arrives in time coincidence with said gating pulse.

3,978,798

FUZE MECHANISM HAVING INTEGRATED SAFETY FUNCTIONS

Kaj Backström, Bergstigen 21B, 182 74 Stocksund; Rolf V. Grahn, Solrosvagen 10; Per O. T. V. Hedenmark, Bergius Vag 4, both of 644 00 Torshalla, and Kjell G. Öhrstedt, Hagalundsvagen 42 D, 653 41 Karlstad, all of Sweden

Filed Nov. 4, 1974, Ser. No. 520,860
Claims priority, application U.S.S.R., Nov. 9, 1973, 151961
Int. Cl.² F42C *9/02*
U.S. Cl. 102—71 **9 Claims**



1. A fuze mechanism for projectiles and the like, which mechanism contains a clockwork (25) brought into operation when the projectile is launched and a blasting cap (35) which is rotated into registration with a firing pin (16) for detonating the fuze after a predetermined series of safety conditions have been met wherein the improvement comprises:

a firing pin lock (14) locking the firing pin and releasable in several successive steps from corresponding positions to unlock the firing pin;

manually adjustable means (19) for releasing the firing pin lock from a first position when the fuze is set or timed;

inertial means (26) for also releasing the firing pin lock from the first position in response to inertial forces generated while the projectile is launched;

a catch (24) connected with the clockwork to inhibit clockwork operation and responsive to preselected movement of the firing pin lock from the first position to release the clockwork and begin clockwork operation; and

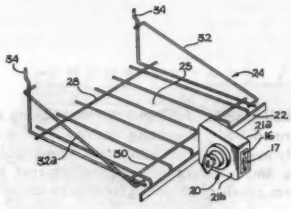
time responsive means (30) connected with the clockwork to release the firing pin lock from a second position at the end of a pre-set time whereby the firing pin is released at the end of the pre-set time to fire the blasting cap.

3,978,799

DISPLAY HARDWARE FOR LOCK SETS

Henry Ross Escalette, Santa Ana, Calif., assignor to TRE Corporation, Beverly Hills, Calif.

Filed Feb. 13, 1975, Ser. No. 549,536
Int. Cl.² A47G *29/00*
U.S. Cl. 108—28 **5 Claims**



1. Display apparatus for packaged lock sets which provides for visual inspection and manual demonstration of each type of lock set comprising:

a shelf of welded wire construction, said shelf having a plurality of wire members in a horizontal plane defining a shelf surface for supporting a plurality of packaged lock sets thereon, said shelf further having side wire members angularly offset from the plane of said shelf surface, said side wire members extending from the front to the back of said shelf to provide structural support thereto and said shelf having a vertically disposed member at the front edge thereof, said verticaly disposed member being disposed below said shelf surface,

means adjacent the back of said shelf for coupling said shelf to a pegboard;

a block for receiving a lock, said block having substantially parallel first and second sides adjoining a substantially vertically disposed front face simulating a portion of a typical door on which the lock might be used, said block being ported and relieved to receive a lock to be displayed with the latch bolt of the lock disposed outward through said front face; and

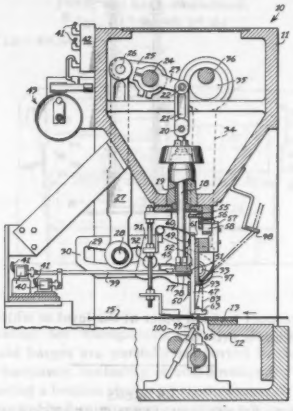
means for coupling the back portion of said block to the front of said vertically disposed shelf member whereby said block is supported forward of said shelf surface and may display an individual lock of the type stored in packaged form on said shelf and whereby said packaged locks may be slid directly forward for removal from said shelf surface.

3,978,800

NEEDLE BAR FOOT CONSTRUCTION FOR MULTIPLE NEEDLE SKIP-STITCH TUFTING MACHINE

Roy T. Card, and Rodney E. Hill, both of Chattanooga, Tenn., assignors to Card & Co., Inc., Chattanooga, Ind.

Filed Aug. 15, 1975, Ser. No. 604,903
Int. Cl.² D05C 11/06; D05B 55/16
U.S. Cl. 112—79 R 9 Claims



1. In a tufting machine for forming skip-stitch, pile yarn patterns in a base fabric, including means supporting a base fabric for longitudinal movement in a feeding plane through said machine, a reciprocable drive member, a plurality of alternating first and second elongated needle bars, each of said needle bars having an operative end portion, means for latching engagement and disengagement of each needle bar to said drive member, and pattern control means for selectively actuating said latch means, the improvement comprising:

a. a first foot member fixed to the operative end portion of each first needle bar,

b. a pair of first needles supported in said first foot member for penetrating said base fabric with pile yarns to form a first pair of tufts therein when said first needle bar is latched to said drive member,

c. a second foot member fixed to the operative end portion of each said second needle bar,

d. a pair of second needles supported in said second foot member for penetrating said base fabric with pile yarns to form a second pair of tufts therein when said second needle bar is latched to said drive member, and

e. said second foot member supporting at least one of said second needles in a vertical longitudinal plane between said pair of first needles.

3,978,801

BALL BEARING LOOPER DRIVE

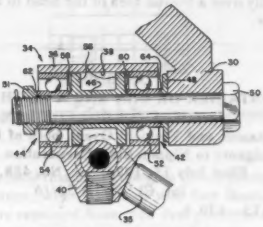
Anthony D. Forte, Chicago, Ill., assignor to Union Special Corporation, Chicago, Ill.

Filed July 9, 1975, Ser. No. 594,394
Int. Cl.² D05B 1/24, 57/30; F16C 35/06
U.S. Cl. 112—176 5 Claims

1. In a blindstitch sewing machine having a frame structure, a main rotary drive shaft and stitch forming mechanism including a looper carrying link adapted to be reciprocated longitudinally, turned angularly through a predetermined arc and tilted pivotally about at least one fulcrum, and force transfer means from said drive shaft for imparting all of such movements to said looper carrying link, said force transfer means comprising:

housing means having a horizontally extending bore means and a connection means generally centrally positioned thereon;

first and second ball bearing set means horizontally spaced apart in said bore means, adjacent the ends of said housing, and having the outer race means thereof secured to said housing means;



spacer means having a horizontally extending bore means positioned in said bore means between said first and second ball bearing set means, abutting only the inner race means thereof; and

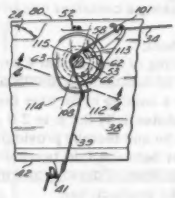
elongated shaft means journaling said ball bearing set means and said spacer means whereby said inner race means of said bearing set means, through said spacer means, are abuttingly lockable such that force transfer from said main rotary drive shaft to said looper carrying link means is through said ball bearing set means.

3,978,802

SEWING MACHINE THREAD TENSIONER

Sidney J. Hamlett, Parma, Ohio, assignor to White Sewing Machine Company, Cleveland, Ohio

Filed Nov. 8, 1974, Ser. No. 521,956
Int. Cl.² D05B 47/02
U.S. Cl. 112—254 2 Claims



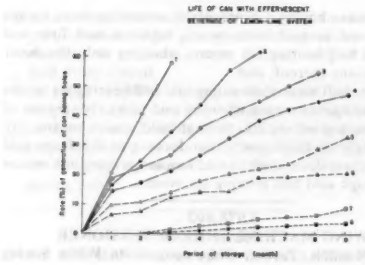
1. In a sewing machine having a bed plate, a standard extending upwardly from the plate, an arm extending from the standard horizontally over the bed plate to a head, said [illegible] being supported by said arm immediately above a work area on the bed plate, said head supporting a needle bar, a thread tensioner device mounted on the upper face of the arm at the head end thereof, thread guide means for directing thread from a supply adjacent the standard and generally below an upper face of the arm through the tensioner device and ultimately to a needle, said tensioner device including means for turning thread in an arc about a vertical axis, means for frictionally engaging portions of the thread in said arc including a pair of friction washers and a spring biasing said washers into abutting contact, said guide means including a pair of guide points for wrapping said thread in said tensioner device about an arc measured on said washers in excess of 180°, whereby said washers are adapted to tilt on said thread to a stable thread-engaging position, said tensioner device and said pair of guide points being a self-supporting subassembly on said head end of said arm, said friction washers and said guide points being disposed above the plane of the upper face of the

arm, each of said guide points being adjacent said tensioner device and each having associated therewith means for restraining the thread from movement vertically upward from the plane of the washers, one of said guide points deflecting thread from said thread turning means slightly towards said standard to produce said arc in excess of 180°, said guide means including means for directing thread from said one guide point forwardly over the upper face of the head and downwardly over a frontal area of the head to a needle on said needle bar.

3,978,803
CONTAINER OR CAN AND A METHOD FOR MANUFACTURING THE SAME

Hidejiro Asano, and Yashichi Oyagi, both of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed July 15, 1974, Ser. No. 488,576
Int. Cl.² B21D *51/16*
U.S. Cl. 113—120 A **2 Claims**



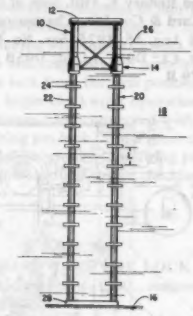
1. A method for making a container or can which comprises the steps of:
providing a steel sheet;
applying a base plating of one of Ni or Cu on said steel sheet to the thickness of substantially 0.005 μ to 1.0 μ;
electrically plating a coating of Sn over said base plating to a thickness of substantially 0.1 μ to 2.0 μ without effecting reflow of the Sn and thereby providing for the absence of any alloy layer between said two platings;
subjecting said steel sheet to drawing and ironing operations to form a cup-like product; and
applying an internal coating of an organic material to said cup-like product.

3,978,804
RISER SPACERS FOR VERTICALLY MOORED PLATFORMS

Pierre A. Beynet, and David A. Dixon, both of Tulsa, Okla., assignors to Amoco Production Company, Tulsa, Okla.

Filed Oct. 15, 1973, Ser. No. 406,434
Int. Cl.² B63B *35/44*
U.S. Cl. 114—.5 D **9 Claims**

1. A method of anchoring a floating offshore structure at a selected location in a body of water having a maximum design wave and current which comprises:
providing an anchor base means at the bottom of the body of water;
providing a plurality of parallel spaced legs connecting and anchoring the offshore structure with said anchor base means, each said leg comprising a plurality of parallel hollow elongated anchoring members each under tension;
providing at vertically spaced intervals a plurality of spacing means for holding the elongated anchoring members in a fixed spaced apart position longitudinally and laterally

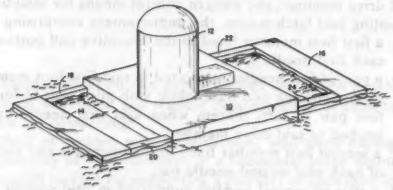


with respect to each other at the level at which the spacing means is provided.

3,978,805
STABILIZED FLOATING PLATFORMS

David G. Thomas, Oak Ridge, Tenn., assignor to The Unites States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 25, 1975, Ser. No. 571,444
Int. Cl.² B63B *35/44*
U.S. Cl. 114—.5 F **2 Claims**

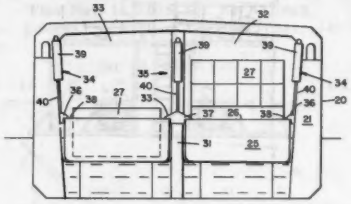


1. A buoyant structure for supporting a load upon a body of water and having in combination therewith stabilizing means for substantially reducing the effect of wave action upon the structure, comprising a buoyant platform for carrying said load and having a lengh-to-breadth ratio in the range between 1 2:1, 2:1, and said stabilizing means which comprise a single pair of discrete elongated floats separated from one another by said platform and oriented on said body of water so that either one of said floats provides the initial contact with wave motion contacting the buoyant structure, said floats being of a rectangular configuration and disposed parallel to one another and to opposite ends of said buoyant platform and having a breadth similar to that of said buoyant platform, and a pair of elongated rigid booms projecting between each of said floats and said buoyant platform for separating each float from said buoyant platform and for rigidly securing each float to said buoyant platform, said rigid booms forming projections with sides of said buoyant platform and separating each float from said buoyant platform a distance in a range corresponding to about one-eighth to about one-half of the length of said buoyant platform.

3,978,806
VESSEL WITH FLOODED HOLD FOR TRANSPORT OF BARGES

William Everett Kirby, Victoria, Hong Kong, and David Jackson Seymour, Daly City, Calif., assignors to Wharton Shipping Corporation, Panama

Filed June 3, 1975, Ser. No. 583,439
The portion of the term of this patent subsequent to Oct. 21, 1992, has been disclaimed.
Int. Cl.² B63B *35/44*
U.S. Cl. 114—43.5 VC 7 Claims



1. A vessel for transporting floating buoyant barges, wherein said barges are partially supported in the vessel by their own buoyancy, including in combination:

a hull having a bottom shell with rigid submarine barge-supporting and hull-reinforcing structure, a bow, a stern, and side walls providing a series of buoyancy compartments, and a hollow enclosed interior,

a centerline longitudinal bulkhead dividing said interior into a pair of longitudinally extending cargo holds, said hull having conduit means communicating with both said holds for free passage of water therethrough into and out from said holds at all times, so that said holds are always flooded during the voyage,

means for introducing and expelling water from said buoyancy compartments to adjust the draft, trim, and list of said vessel,

gate means in said hull for opening to enable flotation loading and unloading of said barges in fore-and-aft orientation into both said holds and for closing during transportation thereof, and

three series of locking spuds for releasably locking said barges in place in said flooded holds against movement relative to said hull all during a voyage of said vessel, with the bottom of each said barge engaging a substantial area of said submarine cargo-supporting structure, each of said spuds having barge-engaging means,

one series of said spuds being affixed to said longitudinal bulkhead and one series of spuds being affixed to each said side wall of said vessel,

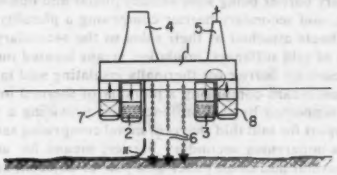
whereby the water in the flooded holds enables the buoyancy of the barge to support the vessel, at least in part.

3,978,807
OFFSHORE STATION AND METHOD OF MAINTAINING THE SAME

Leopold Nitzki, Bremen, Germany, assignor to Aktiengesellschaft "Weser", Bremen, Germany

Filed Jan. 14, 1975, Ser. No. 540,946
Claims priority, application Germany, Mar. 16, 1974, 2412687
Int. Cl.² B63B *35/44*
U.S. Cl. 114—.5 D 11 Claims

1. An offshore station moored at sea, comprising a platform; a plurality of first floats supporting said platform from below at a first platform-supporting position, said first floats being subject to corrosion and marine fouling so that they require periodic maintenance of at least their normally submerged portions; a plurality of second floats underneath said platform and adapted to support the same from below at a second platform-supporting position adjacent said first position, said second floats being free of corrosion and marine fouling; and means for interchanging said first floats with said second floats, said interchanging means including ballasting means in

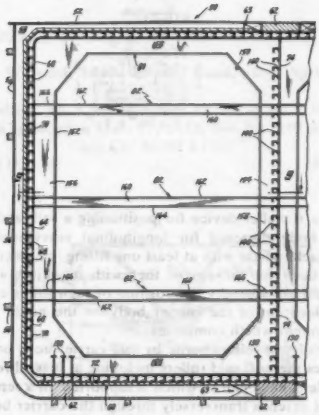


said first and second floats for changing the respective floating levels of the latter, whereby all of said first floats requiring maintenance are removed from their first platform-supporting position and exchanged with said second freshly maintained floats so that the latter now support said platform at said second position.

3,978,808
DOUBLE WALL CARGO TANK FOR TRANSPORTING CRYOGENICS

Joseph J. Cuneo, Scarsdale, N.Y., and Ivan Mertl, Greenwich, Conn., assignors to John J. McMullen Associates, Inc., New York, N.Y.

Filed Sept. 11, 1973, Ser. No. 396,302
Int. Cl.² B63B *25/16*
U.S. Cl. 114—74 A 20 Claims



1. A double wall tank for the transportation of cryogenic materials by ship, the tank comprising: a liquid and gas-impervious primary barrier defining a cargo space, said primary barrier being substantially planar; a plurality of primary webs rigidly connected to the inner surface of said primary barrier and extending into said cargo space in a plane substantially perpendicular to the plane of said primary barrier; a plurality of stiffeners rigidly connected to the outer surface of said primary barrier and extending substantially perpendicular to the plane of said primary webs, each of said stiffeners comprising a web portion lying in a plane substantially perpendicular to the plane of said primary barrier, a primary flange portion attached to said web portion, lying in a plane substantially parallel to the plane of said primary barrier and rigidly connected to the outer surface of said primary barrier, and a secondary flange portion spaced from said primary barrier,

connected to said web portion of said stiffener and lying in a plane substantially parallel to the plane of said primary barrier; a secondary barrier spaced from and surrounding said primary barrier and attached to said secondary flange portion of said stiffener in a liquid and gas-impervious manner, said secondary barrier being substantially planar and non-self-supporting, said secondary barrier comprising a plurality of thin metal sheets attached at their sides to the secondary flange portion of said stiffeners; insulation means located outside of said secondary barrier for thermally insulating said tank, said insulation means comprising a plurality of thermal insulation panels supported by said stiffeners and providing a backing and support for said thin sheets of metal comprising said liquid and gas-impervious secondary barrier; means for attaching each thermal insulation panel to a pair of adjacent stiffeners in a substantially liquid and gas-impervious manner; and means for attaching adjacent thermal insulation panels to each other in an overlapping and substantially liquid and gas-impervious manner.

3,978,809

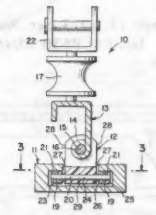
ROLLER TRAVELLER DEVICE

Francis H. Snyder, Jr., Rte. 7, Brookfield, Conn. 06804

Filed July 28, 1975, Ser. No. 599,356

Int. Cl.² B63H 9/10

U.S. Cl. 114—204 **2 Claims**



1. In a traveller device for positioning a sail, and having a carrier body disposed for longitudinal movement along a guide track, a base with at least one fitting, connected to said carrier body for movement therewith to adjust a line that controls a sail whereby the position of such sail is established by the location of the carrier body on the guide track, the improvement which comprises:

a plurality of rollers borne by said carrier body on opposite sides thereof, said rollers including at least three pairs of rollers, each pair of which is supported on a separate axle that extends transversely through the carrier body and is supported thereby for rotation relative thereto, said rollers being disposed in spaced-apart relation along the length of the carrier body and for rolling contact engagement with longitudinally extending surfaces of the guide track to accommodate the movement of the carrier body therealong;

said carrier body having a limited elastic flexibility operable to maintain all of said rollers in rolling contact engagement with said longitudinally extending surfaces of the guide track as against limited deviations of said surfaces from a planar configuration;

said base being hingedly connected to the carrier body for pivotal movement relative thereto about a longitudinally extending axis;

and said carrier body having surfaces disposed to frictionally engage said guide track under the influence of transversely directed forces applied to the carrier body by said base through the hinged connection thereof.

3,978,810

MOORING BUOY

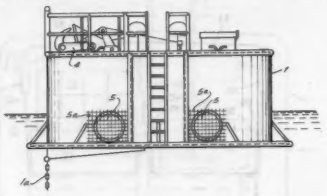
Wilhelm Lucht, Nordenham, and Gunter Ecke, Bremerhaven, both of Germany, assignors to Aktiengesellschaft "Weser", Bremen, Germany

Continuation of Ser. No. 444,240, Feb. 20, 1974, abandoned. This application June 27, 1975, Ser. No. 591,064

Claims priority, application Germany, Feb. 23, 1973, 2308999

Int. Cl.² B63B 21/00

U.S. Cl. 114—230 **7 Claims**



1. In an arrangement for anchoring watercraft floating on a body of water, a combination comprising anchor means disposable at the bottom of the body of water; variable buoyancy buoy means including a generally hollow float body provided with a recess; means for connecting said buoy means to said anchoring means; means for varying the buoyancy of said buoy means; means for actuating said varying means so as to submerge and surface said buoy means by varying the buoyancy thereof; mooring means including a mounting portion mounted in said recess of said float body for pivoting with respect to the latter about a substantially horizontal axis and a rapid-release slip hook on said mounting portion and operative for anchoring the watercraft thereto when said buoy means is surfaced and for releasing the watercraft during the submerging of said buoy means; an auxiliary float on said body, flexible conduit means connecting the auxiliary float with said body; means for normally holding said auxiliary float to said body; and pressure responsive means for automatically releasing the auxiliary float when said body has sunk to a predetermined depth.

3,978,811

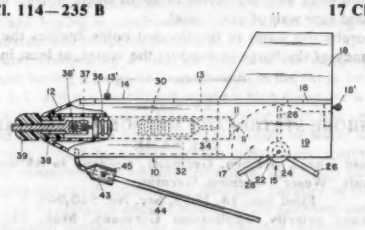
TROLLING DEVICE WITH PARAMETER DETECTING MEANS FOR CONTROLLING THE DEVICE

Charles D. Angus, 302 N. Buchanan St., Spring Lake, Mich. 49456, and John C. Angus, 2716 Colchester Road, Cleveland, Ohio 44106

Filed Mar. 17, 1975, Ser. No. 559,136

Int. Cl.² B63B 21/00

U.S. Cl. 114—235 B **17 Claims**



1. A device for controlled movement through a fluid comprising:

a body including means for stabilizing said body for motion through a fluid;

a freely rotatable element rotatably coupled to said body for providing a motion-controlling force to said body when held in a stationary position but not substantially affecting the motion of said body when rotating; and

control means for detecting a predetermined parameter and selectively preventing rotation of said freely rotatable element in response to a detected predetermined level of said predetermined parameter to cause said body to move in a selected manner.

3,978,812

SELF-PROPELLED CROSSING AND FLOATING BRIDGE IMPLEMENT ALSO USABLE AS A LAND VEHICLE

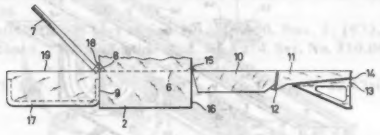
Gerhard Wagner, Mainz-Lerchenberg, Germany, assignor to Magirus-Deutz Aktiengesellschaft, Ulm, Germany

Filed Nov. 14, 1975, Ser. No. 632,068

Claims priority, application Germany, Nov. 14, 1974, 2453925

Int. Cl.² B60F *3/00*

U.S. Cl. 115—1 B **6 Claims**



1. A self-propelled crossing and floating bridge implement also usable as land vehicle, which includes: a main floating body with a deck surface, auxiliary floating means pivotally connected to said main floating body so as to be pivotable into a first position above said main floating body when said implement is used as land vehicle, said auxiliary floating means also being pivotable from said first position to a second position alongside one longitudinal side of said main floating body, a buoyancy body pivotally connected to said main floating body and pivotable to a position alongside the other longitudinal side of said main floating body, and a roadway plate linked to said main floating body and resting thereon when said implement is not used as bridge element, said roadway plate also being shiftable onto said buoyancy body when the latter occupies its position alongside said other longitudinal side of said main floating body, said buoyancy body also being shiftable from its position alongside said other longitudinal side of said main floating body into the position above said main floating body to cover up said auxiliary floating means when the latter occupy their first position above said main floating body.

3,978,813

PROPELLER-DRIVEN HYDROPHONE ARRAY TENSIONING DEVICE

George O. Pickens, San Diego, and Charles E. Hansen, Chula Vista, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 9, 1976, Ser. No. 647,686

Int. Cl.² B63B *21/56*

U.S. Cl. 115—6 **16 Claims**

1. A tensioning device for applying a tensional force to a submarine structure comprising:

a surface float;

a pendent line attached to said float and extending downwardly therefrom;

an electrical conductor carried by said pendent line for transmission of electrical energy therealong;

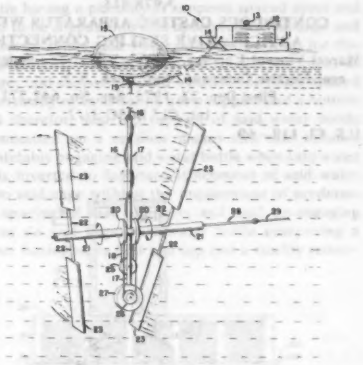
a support attached at one end thereof to said pendent line at the lower, distal end thereof;

an electrical motor mechanically attached to said support means at the end opposite said one end to which said pendent line is attached for providing hydrodynamic stability;

a cross member attached to said support forming a cruciform support therewith;

hydrodynamic screw means rotably mounted on said cross member for providing translatory force on the tensioning device;

power transmission means effectively joining said electrical motor and said hydrodynamic screw means for the transmission of mechanical energy therebetween; and



hitch means effectively connected to said support means for attachment to the submarine structure, whereby the translatory force applied to the tensioning device may be effective to provide a tensioning force to the submarine structure.

3,978,814

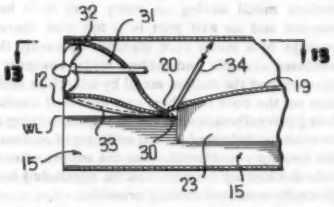
AIR NOZZLE CONTROLLED MARINE PROPULSION SYSTEM

James C. Willyard, 14204 Knotley Road, Silver Spring, Md. 20904

Division of Ser. No. 376,334, July 5, 1973, Pat. No. 3,888,202. This application Mar. 17, 1975, Ser. No. 559,225

Int. Cl.² B63H *11/02*

U.S. Cl. 115—15 **15 Claims**



7. In a marine vessel of the hull displacement type wherein the vessel hull is partially submerged when said vessel is in motion, a propulsion system comprising:

a flow duct extending along the bottom of said hull, said duct being open at both ends and enclosed within said hull along its top, bottom and sides, said duct being mostly submerged with the upper portion of its forward end extending above the water line when said vessel is in motion;

a reaction device in the form of an elongated nozzle defined across the width and proximate the forward end of said duct through the top wall of said duct, said nozzle being connected to an air inlet positioned to receive pressurized air from the bow of said vessel, said nozzle being oriented to issue a high velocity air jet from a location above the in-operation water line of said vessel in a generally rearward direction at a slight angle to the water surface;

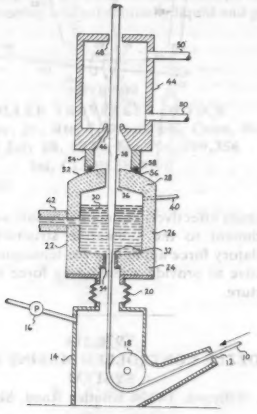
selectively actuable air blower means disposed in said air inlet to impart velocity enhancement to air flowing towards said nozzle;

whereby air driven rearwardly by said nozzle initiates a reactive force which drives said vessel in a forward direction without imparting a lift force to said vessel.

3,978,815
CONTINUOUS CASTING APPARATUS WITH AN ARTICULATIVE SEALING CONNECTION

Marcel Vincent Carrara, Schenectady, N.Y., assignor to General Electric Company, New York, N.Y.

Filed Dec. 22, 1975, Ser. No. 642,771
Int. Cl.² B05C 3/12
U.S. Cl. 118—69 **6 Claims**



1. Apparatus for the continuous casting of metal by passing a metal core member upwardly through a body of molten metal and thereby accreting and solidifying molten metal on the core member, comprising:

a. a tiltable enclosed casting crucible for the containment of molten metal having an entry port in a bottom wall thereof and an exit port in a top wall thereof for the passage of a metal core member upwardly through the enclosed crucible and molten metal contents thereof to thereby cast the molten metal by accretion and solidification on the core member, said enclosed casting crucible being pivotally mounted for tilting and having a feed inlet in a side wall thereof for the addition of molten metal into the casting crucible whereby the supply of molten metal into the casting crucible can be controlled by tilting the pivotally mounted casting crucible;

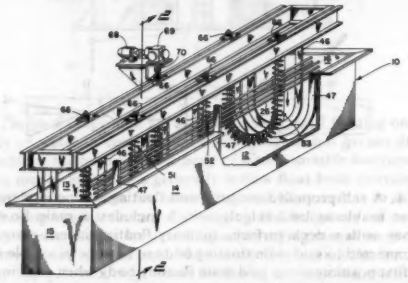
b. an enclosed cooling chamber suspended above the tiltable enclosed casting crucible having a lower entry opening and an upper exit opening for the passage of a metal core member with cast metal accreted and solidified thereon from the casting crucible upwardly through the enclosed cooling chamber for the cooling thereof; and,

c. an articulative sealing connection operatively adjoining the exit port in the top of the tiltable enclosed casting crucible with the lower entry opening of the enclosed cooling chamber for the passage of a metal core member upwardly through the tiltable casting crucible and therefrom into and through the cooling chamber, said articulative sealing connection comprising the combination of the tiltable casting crucible top wall having an outer spherical surface extending around the exit port therein and the cooling chamber lower entry opening having a depending annular lip of relatively large diameter surrounding the casting crucible exit port and in circumferential slidable sealing contact with the spherical surface of the top wall thereof whereby the sealing connection adjoining the casting crucible exit port and the cooling chamber entry opening for the passage of the core member upwardly therethrough is maintained while tilting the casting crucible on its pivotal mount.

3,978,816
U-SHAPED SCREW TRANSFER MEANS IN IMMERSION COATING APPARATUS

Joseph T. Saloom, Youngstown, Ohio, assignor to Wheatland Tube Company, Wheatland, Pa.

Filed Oct. 15, 1974, Ser. No. 514,606
Int. Cl.² B05C 3/10
U.S. Cl. 118—426 **15 Claims**

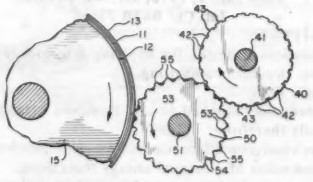


1. An apparatus for moving elongated objects through a liquid coating material contained in a reservoir comprising at least two spaced apart generally vertically oriented, U-shape screws which are partially submerged in the coating material, means to convey the elongated objects to said screws for support thereby, means simultaneously to rotate said screws about their axes to move said elongated objects through said coating material means associated with said U-shaped screws to maintain the elongated objects in driving contact with the screw, and means to remove the coated elongated objects from said screws.

3,978,817
PATTERNED GRAVURE AND DOCTORING MEANS THEREFOR

Oscar G. Hauser, Rochester, and Fred W. Schmidlin, Pittsford, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 16, 1975, Ser. No. 578,064
Int. Cl.² B05B 5/02
U.S. Cl. 118—637 **12 Claims**



1. In an apparatus for reproducing a selected image by electrostatically attracting development fluid toward receiving means:

patterned gravure means, having a plurality of pockets movable into facing relationship with said receiving means; said pockets being adapted to carry discrete quantities of development fluid characterized by a meniscus;

means defined by each of said pockets, defining a constant point of maximum reach;

means, extending from said patterned gravure means, for spacing each of said constant points a predetermined distance from said receiving means when corresponding pockets are moved into facing relationship with said receiving means; and

a doctoring roll, engagable with said gravure means; said doctoring roll having a surface comprising a plurality of recesses each adapted to accommodate a corresponding spacing means in said gravure means to remove excess development fluid therefrom prior to the movement of pockets adjacent to said spacing means into facing relationship with said receiving means.

3,978,818

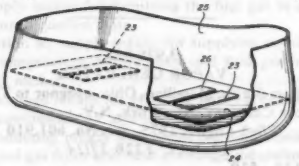
LITTER PACKAGES

Ladd L. Heldenbrand, 2 Bay Road, South Portland, Maine 04106

Continuation-in-part of Ser. No. 412,700, Nov. 5, 1973, abandoned. This application Sept. 27, 1974, Ser. No. 510,002

Int. Cl.² A01K *29/00*

U.S. Cl. 119—1 **12 Claims**



1. A litter package comprising a container of transparent waterproof material, a body of litter within the container for use by a pet animal after the package has been opened to expose the litter with the litter covering the bottom of the container when disposed for use, said body consisting of absorbent particles that are chemically neutral when wet, and testing means within the container and of an indicator type changing color if wetted by urine containing a particular color-changing reactant indicative of an unfavorable current health condition of the animal, said testing means so located within the container that when the container is disposed for use, test areas are provided where they will become wetted by urine in any position the animal will normally occupy while urinating during a predetermined time interval, each test area dimensioned to provide a colored signal, if said reactant is present in the animal's urine, that is readily distinguishable from the remainder of the litter body during the disposal thereof.

3,978,819

CAGE AND ACCESSORIES THEREFOR

Robert O. Lovitt, 1609 Terbit, Fort Worth, Tex. 76112

Filed Nov. 25, 1974, Ser. No. 526,785

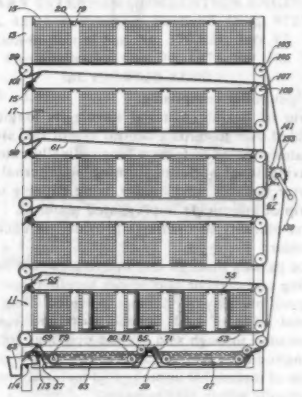
Int. Cl.² A01K *31/04*

U.S. Cl. 119—22 **13 Claims**

10. A rodent cage and water bottle combination comprising:

a. a rodent cage having a perforate bottom to allow wastes to be dropped by gravity exteriorly of said cage; having a continuous periphery of walls extending upwardly from said bottom, at least one of said upwardly extending walls affording a view of the interior of said cage, at least one of said upwardly extending walls adapted at the top thereof to engage a member to form a lid, at least one of four upwardly extending walls that is accessible when said cage is installed in a battery having a plurality of spaced apart apertures penetrating therethrough for supporting a water bottle and having at least one other aperture for insertion of a drinking nozzle; said cage comprising a basket having bottom and walls of open grid structure and an invertible insert disposed peripherally therewithin, said insert being solid and opaque along a plurality of said walls and having a plurality of windows at a predetermined edge; and

b. a drinking bottle attached to said rodent cage; said drinking bottle having a plurality of supports spaced apart and adapted to be slipped into said apertures in said cage and thereafter to retain said water bottle in position for dispensing drinking water on demand to said occupant of said cage; said supports of said water bottle being spaced apart vertically so as to define a top support and a bottom support therefor; said top support of said water bottle being mounted on a retainer means and said retainer means slidably engaging said water bottle when said water bottle is inverted to facilitate attachment of said water bottle to said cage without the requirement of predetermined spacing of said supports and said co-engaging apertures on said cage; said water bottle comprising a container having at its first and top end a readily removable lid that can be snapped open with one hand and that seals vacuum tight when pressed into position, a tubular outlet adjacent its second and bottom end; said bottom end being sealingly connected with the walls for holding said water and vacuum; a flexible conduit connected with said outlet; a drinking nozzle of reduced diameter connected with said flexible conduit; said drinking nozzle comprising an elongate inner bore having a diameter less than 5 millimeters and sufficiently small to prevent leaking of water when said vacuum tight lid is sealingly snapped into place and holds a vacuum on said water, and no demand for water is being made by the occupant of said cage; said flexible conduit and said drinking nozzle extending laterally and adapted for insertion of a drinking end interiorly of said cage to afford drinking water to said occupant; said water bottle container, vacuum-tight lid, sealed bottom, flexible conduit and drinking nozzle coacting to dispense water on demand and not otherwise in normal operation and readily refillable by the simple expedient of snapping said top off and refilling said container with flow through said flexible conduit and drinking nozzle being prevented during filling to prevent water running from said container.



3,978,820
PROTECTIVE PET COLLAR

Vera L. Drehman, 17710 SW. 109 Place, Perrine, Fla. 33157

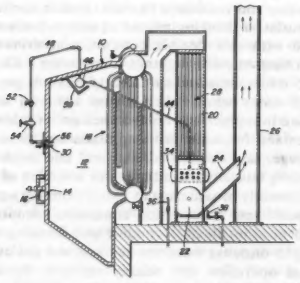
Continuation of Ser. No. 351,801, May 29, 1973. This application July 19, 1974, Ser. No. 489,917
Int. Cl.² A01K 27/00
U.S. Cl. 119—106 3 Claims

1. A pet collar comprising:
a strip of flexible material having its longitudinal edges folded over towards a central axis of said strip of flexible material so as to form a longitudinally extending holder having inner surfaces forming an internal passage and outer surfaces, said holder being capable of receiving a strip of insecticide impregnated material;
a first plurality of openings provided in each end of said holder;
a lace passing through said openings within said holder for tying said ends of said holder together;
a second plurality of openings provided along each longitudinal edge of said flexible strip and said lace being threaded through said second openings so as to join the longitudinal edges of said flexible strip together; and
a strip of insecticide impregnated material positioned longitudinally within said passage.

3,978,821
ENERGY PRODUCER USING DUAL FUELS

Edward T. Schreiber, 7400 Lyndale Ave. South, Minneapolis, Minn. 55423

Filed May 9, 1975, Ser. No. 576,201
Int. Cl.² F22B 1/00
U.S. Cl. 122—5 7 Claims

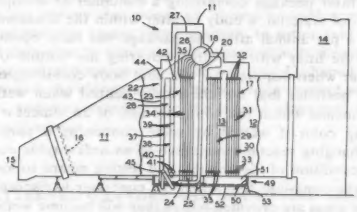


1. In combination with a combustion chamber into which air and a primary fuel are admitted for continuous burning, an exhaust outlet for said chamber whereby exhaust gases may be vented from said chamber, supplemental fuel inlet means for said combustion chamber, steam generator means having a steam outlet, a gas generator including a housing having a predetermined amount of iron filings disposed therein and fluid inlet and fluid outlet means, means connecting said steam outlet with said fluid inlet means, means communicating said fluid outlet means with said supplemental fuel inlet means, said gas generator housing being closed and disposed within said combustion chamber for heating of said housing, the iron filings therein and the steam discharged into said housing from said steam generator, said steam generator being disposed in good heat transfer relation with at least some of the exhaust gases passing through said exhaust outlet, the steam generated in said steam generator being discharged into said gas generator housing and converted, at least to a great extent, into its hydrogen and oxygen gas components by catalytic action upon being further heated in said housing and passing through the latter in intimate contact with the heated iron filings in said housing with the hydrogen and oxygen gases produced in said gas generator then being admitted into said combustion chamber as supplemental fuels through said supplemental fuel inlet means.

3,978,822
VAPOR GENERATOR

John William Smith, Massillon, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Aug. 4, 1975, Ser. No. 601,910
Int. Cl.² F22B 37/24
U.S. Cl. 122—510 7 Claims



1. A bottom supported steam generator having walls defining a gas passage, means for introducing heating gases through said passage, upright tubes disposed within said passage, at least some of the tubes forming a plurality of spaced platens arranged parallel to one another in a direction transverse to the gas flow, each of said platens having its lower end connected to header means, and means for bottom supporting said header means, the bottom support means comprising a grid formed of intersecting structural members, means fixedly connecting said grid and header means, the grid being mounted on pedestals, and including slidable plate means interposed therebetween.

3,978,823

LPG BURNING INTERNAL COMBUSTION ENGINE, ESPECIALLY OTTO ENGINE

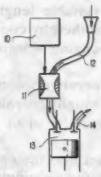
Michael Simon, Munich-Obermenzing, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg AG, Germany

Filed Aug. 27, 1973, Ser. No. 391,773

Claims priority, application Germany, Aug. 26, 1972, 2242049

Int. Cl.² F02B 75/00

U.S. Cl. 123—1 A 16 Claims



1. An internal combustion engine arrangement comprising:
fuel supply means for supplying the fuel gas in a low-temperature liquefied state,
combustion air supply means for supplying combustion air at a temperature higher than said fuel gas in said fuel supply means,
heat exchange means for effecting heat exchanger between said combustion air and said fuel gas,
and conducting means for conducting said combustion air and fuel gas from said heat exchange means to an engine combustion chamber,
whereby said combustion air is cooled down prior to combustion by its use as a heat-emitting heat-exchanging medium for preheating the low-temperature liquefied fuel gas, and
wherein said heat exchange means is constructed as a carburetor which directly mixes said combustion air and liquefied fuel gas at a position upstream of said combustion chamber.

3,978,824

ROTARY PISTON INTERNAL COMBUSTION ENGINE OF TROCHOIDAL CONSTRUCTION

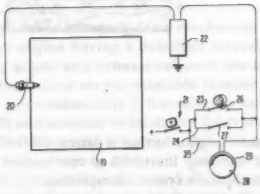
Wolf-Dieter Bensinger, Stuttgart; Gunter Worner, Rommelshausen, and Dietrich Kurz, Stuttgart, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Continuation of Ser. No. 307,764, Nov. 20, 1972, abandoned. This application Dec. 12, 1974, Ser. No. 532,177

Claims priority, application Germany, Nov. 20, 1971, 2157646

Int. Cl.² F02B 53/12

U.S. Cl. 123—8.09 27 Claims



1. A rotary piston internal combustion engine of trochoidal construction having at least one stage, the engine including a housing means, spark plug means disposed in said housing means for igniting a fuel-air mixture, means for supplying ignition impulses to said spark plug means, a trochoidal running surface means provided in said housing means, an eccentric shaft disposed in said housing means, a polygonal piston means for each stage rotatably supported on a corresponding eccentric of said eccentric shaft, said piston means sliding with its piston corners along said trochoidal running surface means and forming a piston flank between each two corners, a working chamber coordinated to each piston flank, said housing means including an inlet channel means and an exhaust channel means, and a throttling device disposed in said inlet channel means, said throttling device being selectively displaceable from an open to a closed position, the improvement comprising: control means for selectively suppressing an ignition pulse to said spark plug means, said control meand being operatively connected with the impulse supplying means and the throttling device and operated in dependence upon the position of the throttling device and the number of stages of the engine, said control means with the throttling device in a closed and substantially closed position, after an ignition of fuel-air mixture in a working chamber, suppresses at least once an ignition of the fuel-air mixture in the same working chamber for achieving at least one of the two characteristics consisting of high uniformity and small periodic length of the torque at the eccentric shaft.

3,978,825

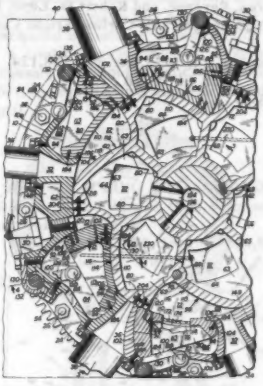
ROTARY INTERNAL COMBUSTION ENGINE

Paul Rogers, 451 SW. Primrose, Portland, Oreg. 97219

Continuation-in-part of Ser. No. 370,821, July 13, 1973, abandoned. This application Oct. 29, 1974, Ser. No. 518,584

Int. Cl.² F02B 53/00

U.S. Cl. 123—8.45 3 Claims



1. A rotary internal combustion engine comprising:
a. a tubular stationary housing,
b. the inner surface of the housing having at least one pair of circumferentially spaced recesses therein,
c. the pair of recesses having associated therewith circumferentially spaced fuel intake means, spark emitting means and exhaust means,
d. a rotor in said housing having an outer surface rotable closely adjacent said inner surface of said housing,
e. said outer surface of the rotor having a plurality of circumferentially spaced rotor cavities therein each registrable with each recess in the housing during rotation of the rotor, each cavity having a forward driving surface extending inwardly from the outer surface of the rotor and a trailing surface extending rearwardly from the inner edge of the forward driving surface to the outer surface of the rotor,
f. a piston in each recess movable freely at both of its ends radially between a position fully retracted in its recess and a position projecting radially inward into a registering rotor cavity, each piston having a front face arranged in sealed, sliding engagement with the front surface of its

recess, the front face of the piston associated with one of the recesses defining with the forward driving surface of a registering cavity, when the piston is projected thereinto, a combustion chamber registering with the spark emitting means, and each piston having an inner surface which, when the piston is projected into a rotor cavity, is disposed at least at its forward end in sealed, sliding engagement with the trailing surface of said cavity throughout the air-fuel combustion and gas-expansion portions of the operating cycle of the engine,

g. timed piston drive means associated with each piston and operable momentarily to move the piston in said one recess inwardly into a registering rotor cavity to effect compression of air-fuel mixture for combustion and thereafter to allow free outward movement of the piston into its recess, and operable momentarily to move the piston in the other recess of the pair inwardly into a registering rotor cavity to effect scavanging of combustion gases from said rotor cavity to the exhaust means and to effect evacuation of the rotor cavity for drawing air-fuel mixture thereinto from the fuel intake means and thereafter to allow free outward movement of the piston into its recess, and

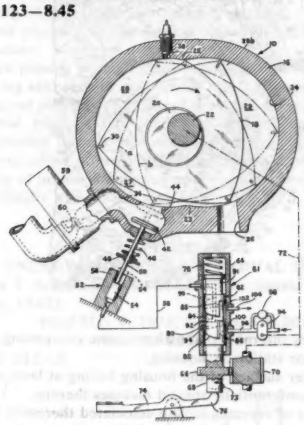
h. power output means connected to said rotor for rotation therewith.

3,978,826

ROTARY ENGINE WITH INTAKE VALVE HAVING A VARIABLE OPEN PERIOD FOR POWER CONTROL

Michael T. Gavrun, Bayonne, and Robert W. Loyd, Jr., Wyckoff, both of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Apr. 14, 1975, Ser. No. 568,124
Int. Cl.² F02B *53/06*
U.S. Cl. 123—8.45 **5 Claims**



1. A power control system for a four-stroke cycle rotary internal combustion engine having an outer body with an internal cavity, the peripheral surface of which has a multi-lobed profile, the outer body having an intake passage and a combustion gas exhaust passage opening into said cavity and having an inner body of generally polygonal profile mounted for relative rotation within said outer body, the apex portions of said inner body having sealing cooperation with said peripheral surface to define a plurality of working chambers which cyclically vary in volume in response to said relative rotation such that each cycle of a working chamber includes an intake phase in which the volume of the chamber progressively expands, said system comprising:

a. an air intake passageway characterized by the absence of any throttle valve but including valve means movable only to either a fully open or a fully closed position for controlling the quantity of air flow through said intake passageway into the engine working chambers during each intake phase;

b. valve actuating means for fully opening said valve means to initiate the intake of air into each working chamber approximately at the beginning of the expansion of said chamber and for closing said valve means during said chamber expansion a variable length of time after the valve means has opened thereby controlling the quantity of air supplied to the engine working chambers during each intake phase;

c. power control means operatively connected to said valve actuating means and manually movable to vary the length of time said valve means is open during each intake phase; and

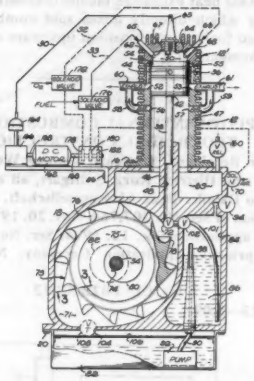
d. means for supplying fuel into the engine working chambers in accordance with the air supplied to said chambers so that variation in the length of time the intake valve means is open during each intake phase regulates the power output of the engine.

3,978,827

PISTON ENGINE EMPLOYING OXYGEN

Marvin E. Wallis, 3755 San Remo Drive, Santa Barbara, Calif. 93105

Division of Ser. No. 408,368, Oct. 23, 1973, Pat. No. 3,905,339. This application June 23, 1975, Ser. No. 589,502
Int. Cl.² F02B *71/00;* **F02D** *31/10*
U.S. Cl. 123—46 R **2 Claims**



1. In a piston engine having a piston carried in a cylinder therefor and defining therewith a combustion chamber, an improved combustion system comprising:

means for injecting fuel into said combustion chamber;

means for injecting a gas containing oxygen in greater than atmospheric proportion into said combustion chamber;

means for spark-igniting said injected fuel and gas;

a variable speed electric motor; and

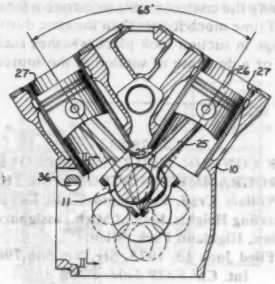
means responsive in predetermined sequence to rotation of said electric motor to effect said fuel and gas injections, and said spark ignition.

3,978,828

V-TYPE INTERNAL COMBUSTION ENGINE

Robert L. Weber, Lacon, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 14, 1972, Ser. No. 280,576
The portion of the term of this patent subsequent to June 7, 1991, has been disclaimed.
Int. Cl.² F02B 75/22
U.S. Cl. 123—55 VE 2 Claims



1. A V-type internal combustion engine comprising a cylinder block having two banks of cylinders disposed at an included angle of 65° with respect to each, a crankshaft having a plurality of longitudinally aligned main bearing journals rotatably mounting said crankshaft in said block and pairs of crankpins with the crankpins of each such pair being overlapped and offset at an angle of 25° with respect to each other, each pair of crankpins positioned between an adjacent pair of main bearing journals and having an overlapped integrally connected area which is at least one-third of the combined areas of such pair of crankpins, said crankpins intersecting at a pair of fillets, each extending circumferentially approximately 145° about a respective crankpin with diametrically opposed S-shaped blended surface areas formed at two circumferentially disposed intersections of said fillets, a rod mounted on each of said crankpins, and a piston connected to each one of said rods and reciprocally mounted in a respective one of said cylinders, and a plurality of counterweights secured to said crankshaft disposed solely on each side of four outer ones of said main bearing journals.

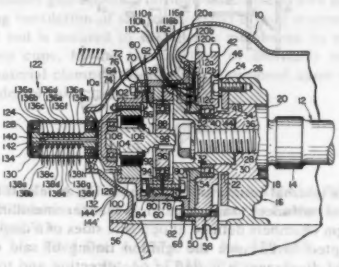
3,978,829

SELF-ADJUSTABLE CAMSHAFT DRIVE MECHANISM

Koichi Takahashi, Yokohama, and Nobuteru Hitomi, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed June 9, 1975, Ser. No. 585,052
Claims priority, application Japan, June 10, 1974, 49-64913
Int. Cl.² F01L 1/34
U.S. Cl. 123—90.15 11 Claims

1. A self-adjustable camshaft drive mechanism of an internal combustion engine having a camshaft rotatable about an axis for driving intake and exhaust valves of the engine, comprising a camshaft drive means rotatable relative to the camshaft about an axis substantially in line with the axis of rotation of the camshaft and adapted to be driven from the crankshaft of the engine, a differential reduction gear unit means coaxially rotatable in its entirety with said camshaft drive means and operatively connected to the camshaft, drive means coaxially rotatable in its entirety with said camshaft drive means and said reduction gear unit means and having an output shaft drivingly connected to said reduction gear unit and rotatable relative to the camshaft and the camshaft drive means about an axis in line with the axis of rotation of the camshaft, said gear unit means being operative to transmit therethrough driving torque from said output shaft of the drive means to said camshaft drive means with reduction of speed of revolution at a predetermined ratio for producing relative rotation between the camshaft and the camshaft drive means by an angle and in a direction which are related to the angle and direction of rotation of the output shaft of the drive means, sensing means associated with the camshaft and the camshaft drive means for detecting an angle and direction of relative rotation between the camshaft and the camshaft drive means and producing an output signal substantially representative of



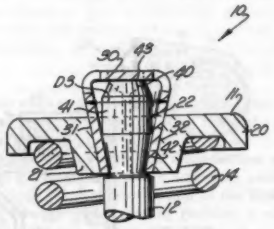
the angle and direction of the detected relative rotation between the camshaft and the camshaft drive means, and control means responsive to said output signal of the sensing means and to preselected operational parameters of the engine for producing a control signal effective to actuate said drive means for causing the output shaft of the drive means to rotate a number of turns and in a direction which are dictated by said control signal.

3,978,830

SNAP-ON SPRING RETAINER LOCK

Ernest J. Toth, Jr., South Euclid, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Jan. 13, 1975, Ser. No. 540,588
Int. Cl.² F01L 3/10
U.S. Cl. 123—90.67 6 Claims



1. Apparatus for holding a spring retainer on a valve stem against the bias of a spring, said apparatus comprising a one-piece retainer lock member for insertion onto one end of a valve stem, said retainer lock member comprising a cup-shaped member having a base and a plurality of spring fingers for resiliently clampingly engaging the valve stem, said base and spring fingers defining a chamber for receiving said valve stem, said spring fingers having a generally frusto-conical outer surface and a frusto-conical inner surface, the frusto-conical outer surface of said spring fingers comprising means engageable with the spring retainer for holding the spring retainer on the valve stem against the bias of the spring.

3,978,831

CONTROL DEVICE FOR A VACUUM ADVANCER

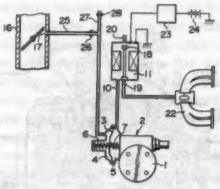
Eiji Yoshikawa, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 7, 1973, Ser. No. 413,620

Claims priority, application Japan, July 3, 1973, 48-78521[U]

Int. Cl.[2] F02P *5/08, 5/10*

U.S. Cl. 123—117 A 5 Claims



1. In an internal combustion engine having an inlet tube and a vacuum advancer, said vacuum advancer including two diaphragm chambers defined at opposite sides of a diaphragm and adapted to advance the ignition timing of said engine when said diaphragm is biased in one direction and to delay said ignition timing when said diaphragm is biased in the other direction, the improvement comprising, a control device for said vacuum advancer, said control device comprising switch-over means for selectively introducing either the vacuum in the inlet tube or manifold or atmospheric pressure into one of said diaphragm chambers, and a fraction generating means for constantly generating substantially a one-half fraction of the intake vacuum throughout substantially the entire intake vacuum level, said fraction being constantly introduced into said other of said diaphragm chambers.

3,978,832

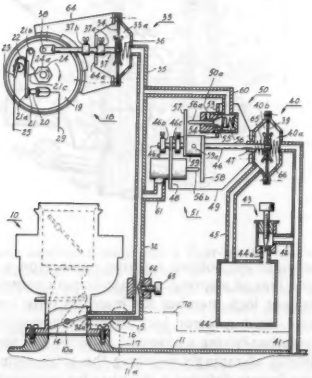
SERVO MECHANISM

Brooks Walker, and Fred V. Hall, both of San Francisco, Calif., assignors to Brooks Walker, San Francisco, Calif.

Continuation of Ser. No. 141,967, May 10, 1971, abandoned, which is a continuation of Ser. No. 571,563, Aug. 10, 1966, abandoned. This application Feb. 15, 1974, Ser. No. 442,835

Int. Cl.[2] F02P *5/02*

U.S. Cl. 123—117 A 10 Claims



1. In an internal combustion engaging provided with a throttle valve, an intake manifold providing a source of suction, the amount of suction being controlled by the throttle position, ignition spark means normally biased to retard timing at closed position of the throttle, and control means operative to overcome said bias to advance the spark timing by increasing suction from the source in response to gradual throttle movement at a rate below a predetermined rate, the improvement comprising: suction change sensitive means responsive to a selected one of either a sudden increase or a sudden decrease in suction at the source in response to sudden movement of the throttle valve greater than the predetermined rate for rendering the control means inoperative to overcome said bias, to permit return of the ignition spark means to retarded timing, said suction change sensitive means including means for maintaining the control means inoperative for an appreciable period of time much longer than the time during which the abrupt change in suction took place whether such change be an increase or a decrease of suction at the source.

3,978,833

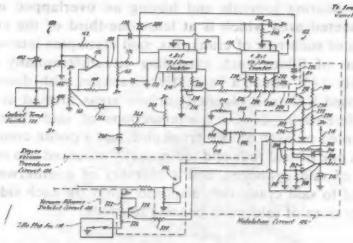
ENGINE CONTROL CIRCUIT FOR PROVIDING A PROGRAMMED CONTROL FUNCTION

Frederick William Crall, Farmington, and LaVerne Andrew Caron, Sterling Heights, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed June 13, 1975, Ser. No. 586,790

Int. Cl.[2] F02P *5/04;* F02B *3/00*

U.S. Cl. 123—117 R 18 Claims



1. An engine control circuit for generating a programmed engine control signal comprising:

a transducer circuit for providing a transducer signal representative of the instantaneous value of a selected engine operating parameter;

an up/down counter circuit adapted to selectively add to and subtract from the count contained therein, an input signal applied thereto;

an input signal generator circuit for generating said input signal and supplying the same to said up/down counter circuit;

a circuit for modifying said transducer signal by the count in said counter circuit to develop said programmed engine control signal; and

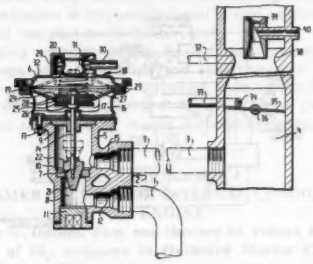
means operatively associated with the engine and said counter circuit for causing said counter circuit to add said input signal to its count when the engine is operating in one selected operating condition and to subtract said input signal from its count when the engine is operating in another selected operating condition.

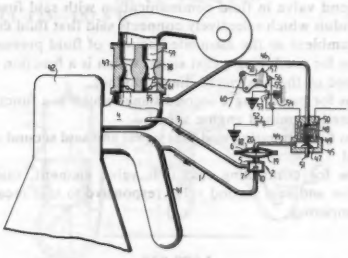
3,978,834

ARRANGEMENT FOR CONTROLLING THE RECIRCULATION OF EXHAUST GAS IN INTERNAL COMBUSTION ENGINES

Henri Arnaud, Antony; Martial Hublin, Cerny; Georges Devaux, Galliene Issy; Claude Lambert, Paris, and Henri Milliot, Arpajon, all of France, assignors to Regie Nationale des Usines Renault and Societe Anonyme dite Automobiles Peugeot, both of Paris, France

Filed Sept. 25, 1974, Ser. No. 509,256
Claims priority, application France, Oct. 9, 1973, 73.36058
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A 14 Claims





1. An arrangement for controlling the recirculation of exhaust gases within internal combustion engines, a recycling passage connecting the exhaust manifold of said engine to the main intake passage of the carburetion system, and within which is inserted a recirculation valve the obturator of which, effecting the opening and closing of the recirculation circuit and normally returned to the closed position by an elastic means under compression, is actuated to the open condition as a result of the variations in displacement of an elastic membrane which is coupled to a control rod of said obturator and closes off a vacuum chamber which is subjected to the variations in vacuum prevailing within the inlet manifold of said carburetion system, wherein:

said obturator of said recirculation valve has a truncated-cone configuration whereby the increase in the area of the variable opening defined between said stopper or obturator and its seat is a function of the engine speed and load;

said stopper also having a height slightly greater than the diameter of the large end thereof, which is approximately three times that of the small end thereof;

said stopper being secured to said elastic membrane which has a large diametrical extent and the displacement of which is slightly greater than the height of said stopper; and wherein further

said membrane is acted upon by a vacuum control system which is dependent upon the speed of rotation of said engine over a range extending from idle condiitions to the highest speeds and maximum loading of said engine,

said elastic membrane of said recirculation valve is clamped at its periphery, between two gaskets of thermally insulating material disposed upon opposite sides of said membrane;

said membrane gasket assembly is in turn clamped between a cover of said vacuum chamber and support means integrally formed with the body of said valve;

said support means is provided with a plurality of apertures for providing good diffusion of the heat carrier by said exhaust gases passing through said valve as well as providing ventilation of said control rod of said stopper; and

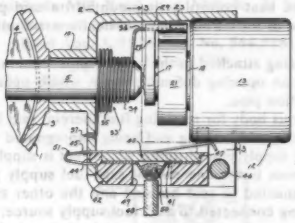
said rod is secured to said elastic membrane by means of two cups, having two washers of thermally insulating material clamped therebetween, disposed upon opposite sides of said elastic membrane.

3,978,835

AUTOMATIC CHOKE ASSEMBLY FOR SMALL ENGINES

Alvin P. Fenton, Oostburg, Wis., assignor to Kohler Company, Kohler, Wis.

Filed Dec. 4, 1974, Ser. No. 529,448
Int. Cl.[2] F02B *33/00*
U.S. Cl. 123—119 F 11 Claims



1. An automatic choke assembly for controlling the flow of air through the air induction passage of an internal combustion engine, the combination comprising:

a choke valve positioned within said air induction passage and mounted for rotation between a running position in which it provides minimal interruption of the flow of air through said passage and a starting position in which it provides substantial interruption of the flow of air through said passage;

bias means coupled to said choke valve to orient it in its running position;

a choke shaft coupled to said choke valve and being operable when moved to rotate said choke valve;

actuation means for moving an actuator shaft from a running position to a starting position when the engine is being started; and

temperature responsive coupling means having one end connected to said choke shaft and its other end connected to said actuator shaft to couple the motion of said actuator shaft to said choke shaft and to adjust their relative positions as a function of the ambient temperature.

3,978,836

SUCTION HEAT CONTROL UNIT IN INTERNAL COMBUSTION ENGINE

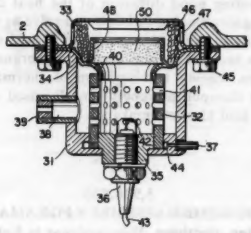
Masaaki Noguchi, Nagoya, and Masaharu Sumiyoshi, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sept. 24, 1974, Ser. No. 508,821

Claims priority, application Japan, Oct. 9, 1973, 48-113549

Int. Cl.[2] F02M *31/00, 31/16*

U.S. Cl. 123—122 G **12 Claims**



1. A suction system for an internal combustion engine, said system comprising:

a carburetor for producing a fuel-air mixture;

a suction pipe, through which the mixture is supplied to the engine, in fluid communication with said carburetor;

a fuel supply source other than the suction pipe;

an air supply source other than the suction pipe;

a suction heat control unit mounted on said pipe downstream of the carburetor, said heat control unit comprising:

a housing attached to the suction pipe, said housing having an opening defined therein which opens into the suction pipe;

a porous body for retaining fuel therein, said body being within said housing and being impregnated with fuel;

a fuel supply pipe through which fuel is supplied to said porous body; one end of said fuel supply pipe being connected to said housing and the other end thereof being connected to said fuel supply source;

an air supply pipe through which air is supplied to said housing; one end of said air supply pipe being connected to said housing and the other end thereof being directly connected to said air supply source; and

an ignition means for igniting the mixture of fuel evaporated from said body and air supplied through said air supply pipe.

3,978,837

DEVICE FOR AUTOMATIC SPEED CONTROL OF A DIESEL ENGINE

Karl-Erik Lundberg, Solna, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 6, 1974, Ser. No. 530,278

Claims priority, application Sweden, Dec. 14, 1973, 7316934

Int. Cl.[2] F02D *1/04;* F02M *39/00*

U.S. Cl. 123—139 E **9 Claims**

1. A device for control of fuel flow for automatic speed control of an associated diesel engine having an associated fuel control device for controlling the fuel to the diesel engine which comprises:

a working cylinder and a working piston, said working piston being movable responsive to fluid pressure on each side thereof;

means coupling said working piston to the associated fuel control device to vary the quantity of fuel delivered to the associated diesel engine as a function of the working piston position;

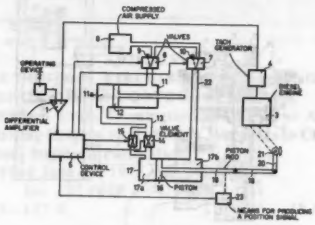
a first fluid conduit in fluid communication with said working cylinder and one side of said working piston;

a second fluid conduit in fluid communication with said working cylinder and the other side of said working piston;

a first valve element disposed in series with said second fluid conduit;

means for balancing two fluid pressures between first and second parts thereof without mixing the two fluids under pressure, one part of said means for balancing being in fluid communication with said second fluidconduit; fluid conduit;

a first valve in fluid communication with said second part of said means for balancing which selectively connects said



second part of said means for balancing to ambient or an associated source of fluid pressure;

a second valve in fluid communication with said first fluid conduit which selectively connects said first fluid conduit to ambient or the associated source of fluid pressure;

means for producing a first signal which is a function of the speed of the associated diesel engine;

means for producing a second signal which is a function of a predetermined engine speed;

means for comparing said first signal and said second signal; and

means for controlling said first valve element, said first valve and said second valve responsive to said means for comparing.

3,978,838

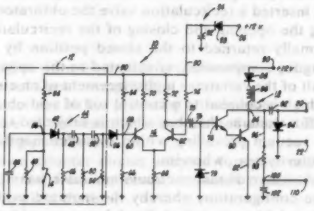
D-C POWER SUPPLY AND IGNITION SYSTEM

George K. Oister, 1109 SE. 11 St., Edmond, Okla. 73034

Filed Feb. 14, 1974, Ser. No. 442,497

Int. Cl.[2] F02P *1/00;* H03K *17/60*

U.S. Cl. 123—148 CA **2 Claims**



1. An engine ignition circuit for generating periodic high voltage from a low voltage D-C power source, comprising:

an input junction connected through a non-linear filter means to said low voltage D-C power source;

contactor point switch means connected between said junction and ground to provide periodic ground disconnection of said low voltage D-C power source;

a resistance-capacitance network connected to said junction and having a network output, said network consisting

of a first capacitor coupled between said input junction and a second junction, a resistor connected between said second junction and ground, a second capacitor connected between said second junction and a network output, and a second resistor connected between said network output and ground, said network serving to prevent generation of a trigger pulse except upon initial opening of said contactor points switch means and for a pre-set time duration thereafter;

one-shot vibrator means connected to said network output and periodically energized by trigger output therefrom to provide an output pulse of pre-set duration;

coil means energized by said low voltage power source and connected in series with a transistor means, said transistor means being normally non-conducting and rendered conductive in response to input of said output pulse from said one-shot multivibrator; and

charging capacitor means having one side connected between said coil means and said transistor means and having its other side connected to an output high voltage terminal whereupon D-C high voltage is present each time said transistor means is rendered conductive.

3,978,839

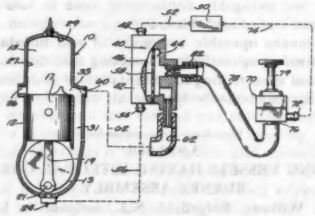
PRIMER SYSTEM FOR INTERNAL COMBUSTION ENGINE

Chester G. DuBois, Zion, and Howard M. Pollari, Libertyville, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 18, 1974, Ser. No. 533,971

Int. Cl.² F02M *1/16*

U.S. Cl. 123—187.5 R **9 Claims**



1. An internal combustion engine including a cylinder having a head end, a piston reciprocal in said cylinder relative to said head end, a port communicating with said cylinder in spaced relation to said head end and subject to pressure variation occurring in response to piston reciprocation, conduit means communicating with said port, a pressure operated fuel pump including a diaphragm defining a pulse chamber communicating with said conduit means and a pumping chamber operable in response to pressure variation in said pulse chamber to effect fuel pumping, and manually operable primer pump means communicating with said port for pumping primer fuel into said cylinder through said port.

3,978,840

CYLINDER HEAD WITH WELDED-ON CYLINDER AND METHOD OF MAKING SAID WELDED UNIT

Herbert Schleiermacher, Bruhl, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany

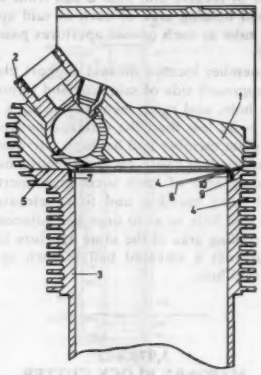
Filed Aug. 21, 1974, Ser. No. 499,543

Claims priority, application Germany, Aug. 21, 1973, 2342114

Int. Cl.² F02F *1/04*; **B23K** *15/00*

U.S. Cl. 123—193 CH **7 Claims**

1. In combination with a cylinder head, tubular cylinder means having one end face electrobeam welded to said cylinder head along a welding seam, said cylinder means having an annular slot provided in said one end portion of said tubular cylinder means to avoid surface post-working and having its



extension of depth in the longitudinal direction of said tubular cylinder means, said welding seam extending from the outer circumference of said tubular cylinder means to said slot.

3,978,841

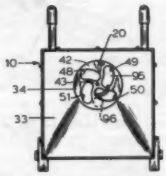
FEEDING APPARATUS FOR BALL PROJECTING MACHINE

Alfredo S. Yarur, 2101 Yorkgate Drive; Alfredo F. Yarur, 4513 Edwards Mill Road, and Nicholas J. Yarur, 2101 Yorkgate Drive, all of Raleigh, N.C. 27612

Filed Apr. 3, 1975, Ser. No. 564,596

Int. Cl.² F41B *15/00*

U.S. Cl. 124—50 **3 Claims**



1. In a ball projecting machine of the type having a frame, a ball hopper for holding a supply of balls and having an opening in the bottom thereof, an elongated feed tube, a rotatable feeding apparatus for singly feeding the balls to the elongated feed tube mounted below the hopper with the feed tube being adapted at its receiving end to receive balls from the hopper opening and at its discharge end to deliver balls to a ball projecting mechanism, an electric motor means for driving the feeding apparatus and having in conjunction therewith control means for controlling the energization and speed thereof, an improved feeding apparatus comprising:

a. a horizontally-positioned apertured disc rotatably mounted on the machine from below the hopper opening and being connected for being driven by said motor means, said disc having a selected number of apertures of sufficient size to receive at least two balls per aperture, each said aperture being shaped so as to have both an inward-leading ball holding area and an outward-trailing ball holding area whereby balls will tend to be forced toward the said outward-trailing area by the centrifugal force created by the rotation of the disc and by the inertia of balls;

b. a support plate member fixed below and parallel to and underlying said disc, said plate member having a hole

communicating with the receiving end of the machine ball feed tube and positioned below the path of the outward-trailing ball holding area of said apertures in said disc so as to receive and pass a ball from the outward-trailing ball holding area of each of said apertures into said feed tube as each of said apertures passes over said hole; and

c. a ramp member located on said support plate ahead of the ball-approach side of said hole and terminating adjacent said hole, said ramp member having a height at its terminal point less than the distance between said disc and said plate member and having a curvature as viewed in plan adapted to cause each successive ball in the inward-leading area of each successive aperture to pass over said ramp member and to be elevated as it approaches said hole so as to urge any adjacent ball in the outward-trailing area of the same aperture into said hole and to prevent a elevated ball in such aperture from entering said hole.

3,978,842

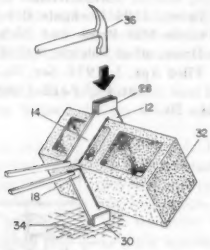
MASONRY BLOCK CUTTER

Leon M. Coffman, 19509 Hart St., Reseda, Calif. 91335

Filed Feb. 27, 1975, Ser. No. 553,595

Int. Cl.² B28D *1/32*

U.S. Cl. 125—23 R **10 Claims**



1. A lightweight portable masonry block cutter comprising:

means including a first pair of blades connected to each other for engaging two adjacent external sides of the masonry block;

means including a second pair of blades connected to each other for engaging the other two adjacent external sides of the masonry block in opposition to said first pair of blades;

handle means for manually urging said blades into resilient engagement with the masonry block around the exterior of said block, and for angularly orienting said block and cutter, means opposite said handle means for connecting said first pair of blades to said second pair of blades for movement toward and away from each other; and means for receiving an impact to move all four of said opposed blades inwardly for cleanly cutting said masonry block in two.

3,978,843

FOOD COOKING OVEN WITH CONTROLLED AIR CIRCULATION

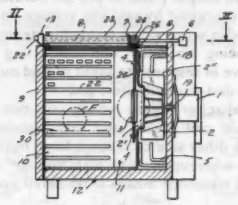
Wilfried Durth, Burbach-Walbach, Germany, assignor to Buderus'sche Eisenwerke Aktiengesellschaft, 633 Wetzlar, Germany

Filed Jan. 6, 1975, Ser. No. 538,562

Claims priority, application Germany, Jan. 9, 1974, 2400845

Int. Cl.² A21B *1/26;* **F24C** *15/32*

U.S. Cl. 126—21 A **6 Claims**



1. An apparatus for treating a foodstuff, said apparatus comprising:

a generally closed housing;

means in said housing for supporting said foodstuff therein;

a fan in said housing having an input side and an output side;

drive means for rotating said fan and circulating air in said housing in a closed path over said foodstuff and through said fan from the input side to the output side thereof;

means in said path in said housing for heating said air;

at least one swingably displaceable vane in said housing adjacent one of said sides; and

control means operable externally of said housing and a transmission operatively connecting said control means with said vane varying the orientation of said vane in said path for controlledly limiting air ciculation along said path.

3,978,844

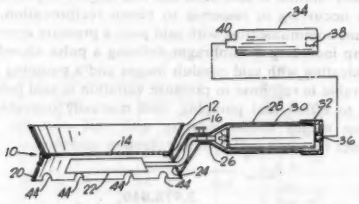
COOKING VESSELS HAVING INTEGRAL GAS AND BURNER ASSEMBLY

Arnold J. Wilkens, Ridgefield, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Apr. 7, 1975, Ser. No. 565,856

Int. Cl.² F24C *5/20*

U.S. Cl. 126—38 **2 Claims**



1. A cooking apparatus which comprises: a vessel; a base supporting said vessel; a burner carried by said base beneath said vessel for heating said vessel; an elongated tubular handle projecting from said base; an adjustable valve within said handle adjacent said base; a conduit interconnecting said valve and said burner; said adjustable valve having a female fitting remote from said conduit; a first elongated container of gaseous fuel for positioning coaxially within said handle; said first container having male and female fittings respectively at its opposite ends; said fittings of said first container being directed axially of said container; said male fitting being en-

gageable with the female fitting of said valve; said male and female fittings of said first container being dimensioned for mating engagement with each other in a manner that a second fuel container identical with the first container may be engaged with said female fitting of said first container for supplying addition fuel to said burner via said first container and for supporting said first and second containers in coaxial relationship.

3,978,845

BURNER IDENTIFICATION DEVICE FOR KITCHEN RANGES

Neal Houbolt, Joliet, Ill., assignor to Jemco Engineering Co., Minooka, Ill.

Filed Sept. 11, 1975, Ser. No. 612,349
Int. Cl.² F24C *3/00*
U.S. Cl. 126—39 R **11 Claims**

1. An apparatus mountable in an opening comprising, in combination:

a plate member having a front face, a rear face and an indicator on said front face;

a pair of securing prongs attached to said rear face and extending therefrom, said securing prong including a tapered end section and a toothed section interposed said plate member and said tapered end section; and

means for keying said apparatus and said opening, whereby said pair of prongs is insertable into said opening at substantially only a predetermined orientation with respect to said openings, said indicator and said keying means having a determined coordinated relationship.

3,978,846

SYRINGE FOR TAKING BLOOD SAMPLES

Donald L. Bailey, 11018 Muriel Place, Thornton, Colo. 80233

Filed Jan. 2, 1975, Ser. No. 538,101
Int. Cl.² A61B *5/14*
U.S. Cl. 128—2 F **10 Claims**

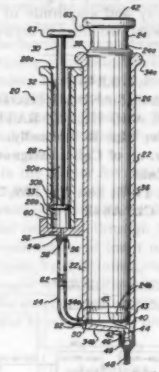
1. In a syringe for drawing blood comprising:

a tubular body having a substantially closed leading end with open connection means at said leading end adapted for connection to a needle to be inserted into a donor's blood vessel to transfer blood from the blood vessel into the tubular body, an open trailing end, and a laterally opening passage near the leading end,

a slide member slidably received in said tubular body in fluid tight relationship therewith,

a void space inside the tubular body at the leading end thereof when the slide member is fully advanced into the tubular body, said slide member having a leading end and said lateral passage is disposed in the general plane of the leading end of the slide member in communication with said void space when said slide member is fully advanced, and

conduit means connected to said tubular body in fluid communication with said lateral passage, said conduit means establishing means for allowing the free flow of air under arterial pressure exerted through said connection means from said tubular body through said conduit means and for preventing any air which may have been in said tubular body from contaminating a sample of blood drawn into said tubular body.

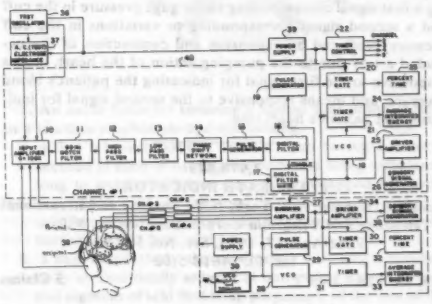


3,978,847

MULTIPLE CHANNEL PHASE INTEGRATING BIOFEEDBACK COMPUTING METHOD

Lester G. Fehmi, Princeton, N.J., and Joseph R. Schneider, Larchmont, N.Y., assignors to Biofeedback Computers, Inc., Rocky Point, N.Y.

Filed July 29, 1974, Ser. No. 492,954
Int. Cl.² D61B *5/04*
U.S. Cl. 128—2.1 B **14 Claims**



1. A method of measuring the electroencephalographic activity of at least two lobes of the brain of a human trainee and providing the trainee with a sensory signal in response to a combination of amplitude and the inphase activity of each of the brain lobes comprising the steps of:

attaching electrical contacts to the head of the trainee, said contacts being disposed adjacent to at least two lobes of areas of the brain, and to a neutral area of the trainee's head;

obtaining at least two signals from said contacts which correspond to each of said at least two lobes or areas of the brain;

amplifying said at least two signals;

filtering each of the signals to obtain output signals each within a defined frequency range;

summing the in-phase signals of the defined frequency band of the amplified brain wave activity to produce a phase relevant measure of the trainee's brain wave activity;

producing an auditory signal and modulating the volume of the auditory signal responsive to the amplitude and phase of the summed brain wave activity; and

presenting to the trainee an audible signal which reflects the degree of phase parity and amplitude of the signals recorded from said at least two lobes or areas of the brain.

3,978,848

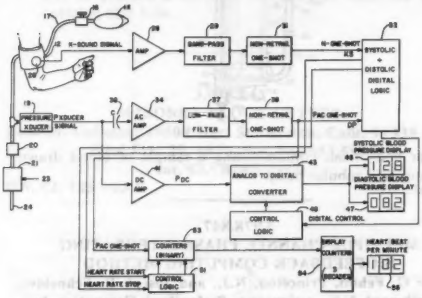
MONITORING APPARATUS AND METHOD FOR BLOOD PRESSURE AND HEART RATE

David H. Yen, Sunnyvale; Tim R. Connelly, Campbell, and John J. Lee, Sunnyvale, all of Calif., assignors to Filac Corporation, Sunnyvale, Calif.

Filed Jan. 9, 1975, Ser. No. 539,799

Int. Cl.[2] A61B *5/02*

U.S. Cl. 128—2.05 M **6 Claims**



1. In a blood pressure and heart rate monitor: an inflatable cuff for controlled occlusion of a patient's artery, pressure responsive transducer means connected to the cuff for providing a first signal corresponding to the gage pressure in the cuff and a second signal corresponding to variations in the cuff pressure produced by expansion and contraction of the occluded artery due to the pumping action of the heart, means responsive to the first signal for indicating the patient's blood pressure, and means responsive to the second signal for indicating the patient's heart rate.

3,978,849

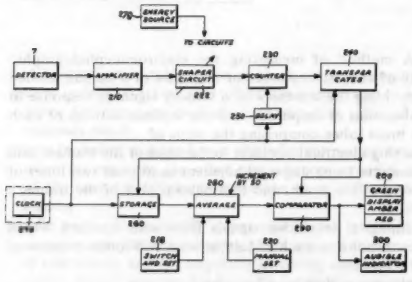
PULSE RATE INDICATOR

Harold S. Geneen, New York, N.Y., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Apr. 17, 1975, Ser. No. 568,884

Int. Cl.[2] A61B *5/02*

U.S. Cl. 128—2.05 T **5 Claims**



1. A body mounted pulse rate indicator comprising in combination: pulse sensing means for detecting heart pulse beats of a wearer and translating said heart pulse beats into corresponding electrical pulses;

counting means coupled to count said electrical pulses to provide a pulse rate;

averaging means for determining the average pulse rate of the wearer at rest to establish a rest pulse rate;

programming means for automatically adding a predetermined increment to said reference pulse rate to denote an optimum safe exercise pulse rate;

means for setting a predetermined maximum level pulse rate into said indicator to denote a danger level pulse rate; and

means for continuously comparing the pulse rate at any time to said optimum safe exercise pulse rate and said danger level pulse rate to denote the state of the pulse rate.

3,978,850

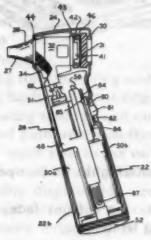
MEDICAL DIAGNOSTIC INSTRUMENTS

William C. Moore, Skaneateles, and Richard W. Newman, Auburn, both of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Mar. 24, 1975, Ser. No. 561,308

Int. Cl.[2] A61B *1/22*

U.S. Cl. 128—9 **6 Claims**



1. In an electrically illuminated medical diagnostic instrument, an elongated hollow body formed of two mating halves, the body having an upper head portion and a lower handle portion, optical means in the instrument body for directing light rays from a light source normally concealed in the interior of the body to a point in the head portion removed from the light source from which the rays are directed outwardly toward the area to be examined, and a light source unit mounted in the handle portion of the body, the unit including a light source in the form of a lamp and means for supplying power to the lamp, means supporting the lamp and power supply means as to be removable as a unit from the handle portion to permit access to the parts of the unit for replacement.

3,978,851

MASSAGING APPARATUS

P. Brav Sobel, 3140 N. Bay Road, Miami Beach, Fla. 33140

Division of Ser. No. 348,128, April 5, 1973, Pat. No. 3,874,373. This application Mar. 31, 1975, Ser. No. 563,572

Int. Cl.[2] A61H *7/00*

U.S. Cl. 128—49 **8 Claims**

1. A stroking device for stroking erogenous zones of a human body, said stroking device comprising:

a housing;

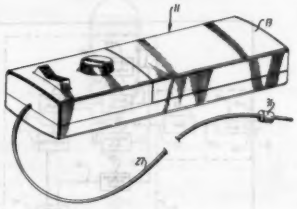
an elongated stroking tool positioned outside of said housing for making contact with said erogenous zones of said human body;

an electric motor for moving said elongated stroking tool mounted in said housing;

mechanical linkage interconnecting said electric motor and said elongated stroking tool;

an electric power source means coupled to said electric motor for furnishing electrical energy to said electric motor;

control means which can be used to adjust the mechanical linkage to a first configuration wherewith said elongated tool is caused to rotate and to a second configuration



wherewith said stroking tool is caused to pivot laterally back-and-forth;

whereby said elongated stroking tool may be brought into contact with said erogenous zones of said human body and caused to stroke said zones in both circular motions and lateral back-and-forth motions.

3,978,852

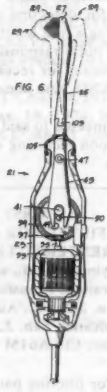
PLAQUE JACK TOOTHBRUSH

Jerry D. Annoni, 41-F Admiral Callaghan Lane, Vallejo, Calif. 94590

Filed Apr. 7, 1975, Ser. No. 565,572

Int. Cl.[2] A61H *7/00*

U.S. Cl. 128—62 A **23 Claims**



1. A powered toothbrush for cleaning teeth and related embrasures, such as the spaces between adjacent teeth at the gum line, by driving the ends of specially constructed brush elements axially (along the brush element axes) in and out against the toothed surfaces to remove plaque and into and out of the gingival cuff to clean this area and into and through the embrasures and the space between adjacent teeth to push out food particles from the embrasures and the space between adjacent teeth, said brush comprising,

a brush holder,

a brush stem member having one end connected to the holder,

a brush head at the other end of the stem member,

said brush head comprising a plurality of elongated brush elements grouped in a relatively small tuft having a shape and length to permit a substantial number of adjacent brush elements to be driven into and through the embrasures and the space between adjacent teeth,

the ends of the brush elements being polished and the brush elements having substantial flexibility for permitting the brush elements to be driven axially into crevices in the tooth surfaces and also into the gingival cuff between the teeth and gums to clean plaque from the tooth surfaces in this area and also to dislodge food particles from the cuff, and

drive means in the holder for rapidly reciprocating the tuft in an axial direction and with sufficient travel to permit the brush elements to be driven far enough into the gingival cuff and into and through the embrasures and the space between adjacent teeth to scrub plaque from the tooth surfaces by frictional engagement of the brush elements on the tooth surfaces and to dislodge food particles from the gingival cuff and the embrasures by physical impact of the brush elements on the food particles.

3,978,853

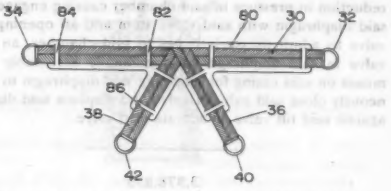
ANKLE HITCH

Robert D. Morrison, Worthington, Ohio, assignor to Morrison Medical Products Company, Columbus, Ohio

Filed June 4, 1975, Ser. No. 583,588

Int. Cl.[2] A61F *5/04*

U.S. Cl. 128—84 R **10 Claims**



1. An ankle hitch for securing a human foot in attachment to a traction mechanism and comprising:

a. a first relatively longer, flexible strap having a fastener secured at each of its opposite ends and being sufficiently long to permit said first strap to be wrapped forwardly around the ankle of said foot, crossed upon the instep of said foot with its ends extending downwardly beyond the bottom of said foot; and

b. a pair of relatively shorter flexible heel straps substantially symmetrically secured at one end of each to a central segment of said first strap posteriorly of the axis of the associated human leg, each of said heel straps having a fastener at its other end; the effective length of each of said straps being of a length which permits all four of said fasteners to be brought together beneath said foot with the straps under tension for connection to said traction mechanism whereby counterbalancing moments are applied to said foot with a resultant traction force in substantial alignment with the axis of the associated human leg.

3,978,854

DEMAND REGULATOR

Justin W. Mills, Jr., Salisbury, Md., assignor to Lif-O-Gen, Inc., Cambridge, Md.

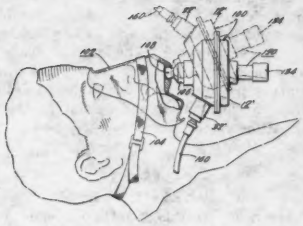
Filed Apr. 8, 1975, Ser. No. 566,081

Int. Cl.[2] A62B *7/00*

U.S. Cl. 128—142.2 **5 Claims**

1. A resuscitator comprising a casing, a flexible diaphragm disposed within said casing, said casing and diaphragm defin-

ing a closed chamber adjacent one side of said diaphragm, the other side of said diaphragm being open to atmospheric pressure, an aperture in said casing opening into said chamber, a breathing mask, a conduit extending between said mask and said aperture to connect said mask with said chamber, a tilt valve assembly in said casing for introducing a pressurized gas into said chamber in response to the pressure differential across said diaphragm, said tilt valve assembly including an elongated valve stem extending into said chamber with the



free end of said valve stem disposed proximate said diaphragm, the inward movement of said diaphragm upon a reduction in pressure in said chamber causing engagement of said diaphragm with said valve stem and an opening of said valve to admit pressurized gas to said chamber, an exhaust valve in said diaphragm, and manually actuatable plunger means on said casing for engaging said diaphragm to simultaneously close said exhaust valve and displace said diaphragm against said tilt valve to actuate said valve.

3,978,855

POLYURETHANE FOAM SURGICAL DRESSING

Wayne A. McRae, Salem, N.H., and Philip B. Reed, Needham, Mass., assignors to Ionics Lyo Products Company, Watertown, Mass.

Filed Jan. 17, 1975, Ser. No. 541,809
Int. Cl.[2] A61L *15/00;* **B32B** *3/26*
U.S. Cl. 128—156 **18 Claims**

1. An integral, non-laminated, non-rigid, open cell polyurethane foam wound dressing article comprising at least one dense surface with essentially all of said surface having a microporous structure of an average pore cell size between about 0.2 to 200 micrometers in contrast to the remaining less dense macroporous portions of the foam having an average pore cell size range between about 200 – 2,000 micrometers, said microporous surface further characterized by an absorbent structure, readily absorbent to water and fluid exudates and comprised of permanently but only partially collapsed or compressed open foam cells as contrasted to the said remaining macroporous foam cell portions which are substantially uncollapsed and non-absorbent.

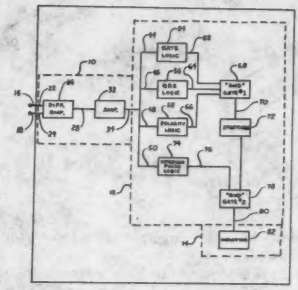
10. The process for producing an absorbent structure on a surface of an essentially non-absorbent, non-rigid, open-cell macroporous polyurethane foam starting material having an average pore cell size range between about 200 – 2,000 micrometers comprising applying sufficient heat and pressure to said foam surface to result in permanently but only partially collapsing the surface cells into a dense microporous integral structure having an average pore cell size range between about 0.2 to 200 micrometers whereby essentially all of said denser surface structure is readily absorbent to water and fluid exudates as contrasted to the remaining untreated macroporous foam cell portions which are essentially non-absorbent.

3,978,856

HEART BEAT WAVEFORM MONITORING APPARATUS

Walter A. Michel, 433 Hillside Drive, Highland Park, Ill. 60035

Filed Mar. 20, 1975, Ser. No. 560,351
Int. Cl.[2] A61B *5/04*
U.S. Cl. 128—2.06 A **7 Claims**



1. Heart beat waveform monitoring apparatus for detecting heart beat waveforms by transducers secured to a patient and for analyzing the waveforms for abnormalities, the apparatus comprising:

first logic means for sensing presence of a QR rise in as heart beat waveform and producing a pulse responsive thereto;

second logic means for sensing presnce of an unusually wide QRS heart beat waveform and producing a pulse responsive thereto;

first AND gate means for receiving pulse signals from said first and said second logic means and passing an output pulse upon coincidence of said signals;

other logic means for detecting absence of a heart beat waveform following a first heart beat waveform and producing an output pulse responsive thereto;

second AND gate means for receiving output pulse signals from said first AND gate means and said other logic means; and

indicator means connected to said second AND gate means to be activated upon receiving a signal from said second AND gate means.

3,978,857

SYSTEM WITH FILTER FOR ADMINISTRATING PARENTERAL LIQUIDS

Charles J. McPhee, Sylmar, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Division of Ser. No. 280,542, Aug. 14, 1972, Pat. No. 3,882,026. This application Feb. 3, 1975, Ser. No. 546,509
Int. Cl.[2] A61M *5/14*
U.S. Cl. 128—214 R **8 Claims**

1. A combination for filtering parenteral solution comprising: a parenteral solution bottle having means for suspending it above a patient, said bottle having a liquid outlet port; an administration conduit connected to said outlet port for draining parenteral solution from said bottle, said administration conduit having a dispensing end; a rigid thermoplastic transparent housing having a hollow chamber and a pair of tubular adapters communicating with this chamber and extending from opposite ends of the housing, one of said adapters being connected to the dispensing end of the administration conduit; a pair of disc-shaped filter membranes fitting inside the hollow housing and permanently secured in face-to-face relationship to the hollow housing, said filter membranes each being of less than 0.375 inch diameter and each having a thickness of from 0.003 to 0.008 inch and having a "depth" of randomly inter-

connected stacked passages of from 20 to 30 micron size, said membrane being of a nonfibrous hydrophobic material and presenting a porous hydrophobic structure impervious to at least 95 percent of all particulate matter of 5 micron size and greater from parenteral solution in the bottle passing through the filter's interconnected passages; said housing including a

plurality of support prongs having rounded generally hemispherical end contact surfaces abutting a central portion of one of said filter membranes to support it during liquid flow therethrough, said support prongs covering less than 20 percent of the effective filter area of the filter membranes; and a hypodermic needle fitting over the other tubular adapter of the hollow housing.

3,978,858

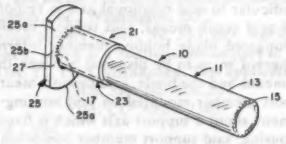
GLASS TUBE AND THERMOPLASTIC RESIN FINGER GRIP SLEEVE ASSEMBLY

Edward A. Tischlinger, Des Plaines, Ill., assignor to MPL, Inc., St. Louis, Mo.

Division of Ser. No. 197,717, Nov. 9, 1971, Pat. No. 3,803,700. This application Mar. 18, 1974, Ser. No. 451,962

Int. Cl.[2] A61M *1/00*

U.S. Cl. 128—237 **5 Claims**



1. A glass tube and non-glass finger grip arrangement for use particularly in packaging and subsequent dispensing of chemicals, comprising a length of substantially constant diameter die-formed glass tube having a peripheral wall with a die-formed bore and outer annular surface, the diameters both of which bore and outer annular surface are each at least several times the thickness of said peripheral wall whereby said glass tube is thin-walled relative to both its outer and bore diameters,

and a sleeve of thermoplastic resin having a laterally extending finger-grip protrusion integrally formed thereon,

said sleeve having an annularly substantially continuous substantially constant diameter inner bore wall in solely friction-retained engagement in a stretched-fit friction-retained state over and along one end of said glass tube,

the diameters of both the bore and the outer annular surface of said glass tube being at least several times the wall thickness of the longitudinally extent of said sleeve extending over and along said glass tube.

said tube having raised surface projections on the outer annular surface beneath and contiguous with the inner surface of said sleeve, said surface projections being of substantially smaller radial thickness than the adjoining overlying portion of said sleeve.

3,978,859

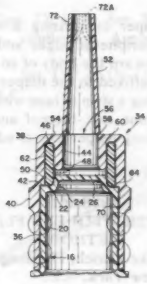
CLOSURE MEMBER FOR PIERCEABLE ACCESS PORTS

John S. Goodenough, Berkeley, and Wendell R. Parker, Moraga, both of Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Jan. 23, 1975, Ser. No. 543,466

Int. Cl.[2] A61J *1/00*

U.S. Cl. 128—272 **23 Claims**



1. In combination, a container for storage and administrationn of parenteral liquids and the like, having a pierceable access port for insertion therethrough of a parenteral administration spike, and a tamper proof protective closure member mounted over and surrounding said access port, wherein:

a. said access port includes:

i. an upstanding wall portion extending from the body of said container; and

ii. a pierceable diaphragm constituting a top closure on said wall portion;

b. said tamper proof closure member including:

i. a base portion engaged around and sealed to said upstanding wall portion of said access port; and

ii. an upwardly extending closed member integrally connected with said base portion;

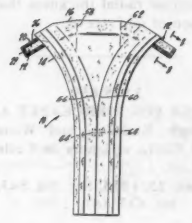
c. frangible means for forming a bacteria proof seal between said upwardly extending closed member and said base portion, said frangible means including a frangible material section and being rupturable to remove at least an upper portion of said upwardly extending member to expose said pierceable diaphragm for insertion therethrough of said spike, said frangible material section having a radial cross sectional extent substantially less than the outer radial cross sectional extent of said base portion relative to the longitudinal axis of said base portion.

3,978,860

TABS FOR DISPOSABLE DIAPERS

Joseph Frank Stima, Edison, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed July 31, 1975, Ser. No. 600,877
Int. Cl.[2] A41B 13/02; A61F 13/16
U.S. Cl. 128—284 7 Claims



1. A disposable diaper comprising a body of absorbent material defined by peripheral edges and having an inside surface for direction toward the body of an infant, and at least one adhesive tape tab affixed to the diaper along a peripheral edge, said tab comprising a strip of tape with pressure sensitive adhesive material on one side thereof and having a pad of cushioning material along its peripheral edge.

3,978,861

DISPOSABLE DIAPER WITH END FLAP MEANS AND METHOD

Charles H. Schaar, Lake Zurich, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 472,531, May 23, 1974, Pat. No. 3,930,501. This application Sept. 15, 1975, Ser. No. 613,603
Int. Cl.[2] A61F 13/16
U.S. Cl. 128—287 2 Claims

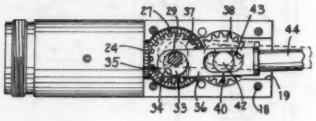
1. A disposable diaper, comprising: an absorbent pad, a liquid impervious backing sheet defining a back surface of the diaper, a front surface, a pair of side edges, a pair of end edges connecting the side edges, with said backing sheet extending to at least one end edge of the diaper, an end flap of the backing sheet adjacent said one end edge, said end flap being folded over the diaper with the front surface of the end flap facing the front surface of the diaper adjacent the end flap, and means for securing laterally spaced portions of said end flap to the front surface of the diaper to permit portions of the flap intermediate the securing means to gap away from the front surface of the diaper.

3,978,862

SURGICAL CUTTING DEVICE

Marshal Morrison, Comstock, Kalamazoo, Mich., assignor to Stryker Corporation, Comstock Township, Kalamazoo County, Mich.

Filed Aug. 26, 1974, Ser. No. 500,373
Int. Cl.[2] A61B 17/14; B27B 19/04
U.S. Cl. 128—317 10 Claims



1. In a surgical cutting device having a housing, an elongated blade holding member movably supported relative to said housing, said blade holding member being adapted to have a cutting blade mounted on the outer end thereof, and drive means mounted on said housing and interconnected to said blade holding member for moving same, comprising the improvement wherein:

said drive means includes crank means rotatable about an axis and connected to said blade holding member adjacent the inner end thereof for causing the inner end of said blade holding member to be movably displaced in a circular pattern within a plane which is substantially perpendicular to the rotational axis of said crank means, said crank means including a drive crank member which is rotatable about and eccentrically displaced relative to said rotational axis, said crank member being disposed directly in engagement with said blade holding member adjacent the inner end thereof; and

support means pivotally and linearly slidably supporting said blade holding member on said housing for permitting simultaneous angular oscillation and linear reciprocation of said blade holding member within a plane substantially perpendicular to said rotational axis in response to rotation of said crank means, said support means engaging said elongated blade holding member intermediate the ends thereof so as to be disposed between the rotatable crank means and the blade, said support means including a support member mounted on said housing for angular movement about a support axis which is fixed relative to said housing, said support member comprising a support crank member which is rotatable about and eccentrically displaced relative to said support axis, said support axis being substantially parallel to but spaced from said rotational axis, one of said support and crank members having slot means associated therewith and extending in the elongated direction of said blade holding member for slidably supporting said blade holding member for linear movement in a direction which is parallel to the longitudinal direction of said blade holding member and perpendicular to said support axis; and

driving means drivingly interconnecting the drive crank member and the support crank member for simultaneous rotation, whereby the cutting edge of the blade is cyclically moved through a path which defines a closed endless loop in response to movement of said blade holding member by said crank means.

3,978,863
EXPANDING TIP EMBOLECTOMY CATHETER WITH INDICATOR BALLOON

Bruce E. Fettel, Diamond Bar, and Samuel Burd, Long Beach, both of Calif., assignors to Bruce E. Fettel, Diamond Bar and Samuel Burd, Long Beach, both of, Calif.

Continuation-in-part of Ser. No. 477,168, June 6, 1974, abandoned. This application Feb. 18, 1975, Ser. No. 550,703

Int. Cl.² A61M *25/00*

U.S. Cl. 128—348 **17 Claims**

1. A biologically compatible expandable tip embolectomy catheter of the type constructed and adapted to be inserted in and advanced through blood passages, which is capable of being followed by X-ray techniques and which includes means to indicate to the user when the inserted expandable tip has been expanded in the body passage, comprising:

a flexible first tube;

a resilient, expandable second tube adapted to engage the thrombus, attached in fluid communication with the first tube at the distal end thereof, the distal end of said second tube being sealed;

a resilient, expandable third tube, which is more resilient to expansion than the second tube, attached in fluid communication with the first tube proximate to the proximal end of the first tube;

means for limiting the expansion of said third tube;

a flexible, X-ray opaque element extending through said tubes, the tip portion of the second tube being attached proximate the end of the opaque element; and

means in fluid communication with the first tube for connecting the catheter to a fluid source, for applying fluid pressure into the catheter from a fluid source to expand the second tube outwardly into contact with the walls of the body passage in which it has been inserted first, then to expand the third tube outside the body until such expansion is empeded by said limiting means to indicate to the user that the expandable tip has been expanded inside the body, and then to expand the second tube further to press against the walls of the body passage.

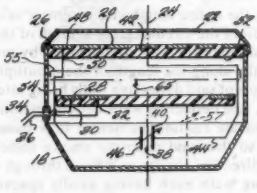
3,978,864
ELECTROTHERAPEUTIC TREATMENT HEAD

Luther B. Smith, deceased, late of Miami Beach, Fla., by William F. L. Fry, and Richard E. Jordan, executors, assignors to L. B. Smith Estates, Inc., Washington, D.C.

Continuation-in-part of Ser. No. 552,999, April 29, 1966, abandoned, which is a continuation-in-part of Ser. No. 494,511, Oct. 11, 1965, abandoned. This application Nov. 17, 1966, Ser. No. 600,341

Int. Cl.² A61N *1/40*

U.S. Cl. 128—404 **15 Claims**



1. A treatment head utilizing electromagnetic energy delivered from an electrotherapeutic drive circuit for electrotherapeutically applying said energy to organic matter comprising a hollow housing including a support means;

conducting and radiating means for transferring said electromagnetic energy to said matter, said conducting and radiating means being mounted within said housing means and spiraling in one place around an axis approximately from said axis to a point located not farther away from said axis than the periphery of said housing means, at least a portion of the conducting and radiating means being substantially flat in the plane of the spiral, the width in the plane of the spiral of at least part of said conducting and radiating means being greater than half the pitch of said conducting and radiating means;

a primary coil connected to said drive circuit for coupling said energy to said conducting and radiating means, said primary coil having a loop-shape and being flat in the plane of its loop and substantially parallel to spiral-shaped conducting and radiating means; and

means for adjusting and spacing between said conducting and radiating means and said primary coil.

3,978,865
IMPLANTABLE PACEMAKER AND ELECTRODE MEMBER THEREFOR

Hector Osvaldo Trabucco, Av.Santa Fe 2926, VI°B, Buenos Aires, Argentina

Filed Jan. 22, 1975, Ser. No. 542,944

Claims priority, application Argentina, Jan. 25, 1974, 252075

Int. Cl.² A61N *1/36*

U.S. Cl. 128—419 P **16 Claims**

9. In an implantable pacemaker for cardiac stimulation, in combination, a generator of electric pulses and a catheter-type electrode insertable from without through the epicardium into the heart muscle for cardiac stimulation, said electrode comprising:

a holder of dielectric material including a stem and an enlarged elastic pad having a substantially flat major surface; and

conductor means connectable to said generator, said conductor means extending through said stem into said pad and forming therein a helically coiled portion projecting outwardly from said major surface, said portion terminating beyond said major surface in an arcuately curved electrically conductive hook of generally semicircular shape lying in a plane substantially perpendicular to said major surface and having a tip pointing back toward said major surface for holding said pad in a sutureless manner onto the heart surface by said pad upon the heart.

3,978,866
SMOKING COMPOSITIONS

Lawrence C. Cook, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Sept. 3, 1974, Ser. No. 502,601

Int. Cl.² A24B *15/00*

U.S. Cl. 131—2 **8 Claims**

1. A smoking material which contains comminuted peanut shells in combination with tobacco or a flavorant additive, said

peanut shells being in a form resembling cut cigarette filler tobacco or cut pipe tobacco.

3,978,867

APPARATUS FOR INCREASING THE VOLUME OF MOIST TOBACCO

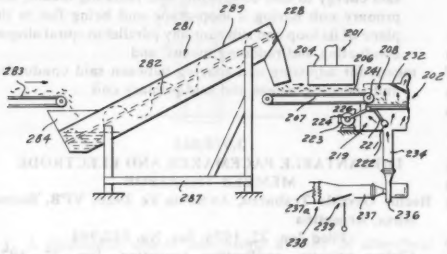
Waldemar Wochnowski, Hamburg, Germany, assignor to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Division of Ser. No. 220,848, Jan. 26, 1972, Pat. No. 3,881,498. This application Apr. 9, 1975, Ser. No. 566,338

Claims priority, application Germany, Jan. 27, 1971, 2103669

Int. Cl.² A24B *3/18*

U.S. Cl. 131—133 R **9 Claims**



1. Apparatus for increasing the volume of tobacco, comprising a feeding unit including a source of supply of a liquid and means for conveying tobacco particles through said supply of liquid to thus subject the particles to an intensive moistening action whereby the particles undergo a pronounced expansion; a drying unit arranged to receive expanded tobacco particles and having means for subjecting the expanded particles to a short-lasting external heating action which is sufficient to effect the drying of tobacco particles in the outer strata immediately adjacent to the external surfaces of tobacco particles and which causes the hardness of said outer strata to substantially exceed the hardness of the inner strata of tobacco particles; and a cooling unit arranged to receive said externally heated particles and having means for subjecting said particles to the cooling action of a fluid coolant resulting in pronounced stabilization of the volume of tobacco particles.

3,978,868

METHOD OF CONDITIONING TOBACCO

Willi Thiele, Geesthacht; Gerd-Joachim Wendt, and Werner Heyden, both of Hamburg, all of Germany, assignors to Hauni-Werke Korber & Co., KG, Hamburg, Germany

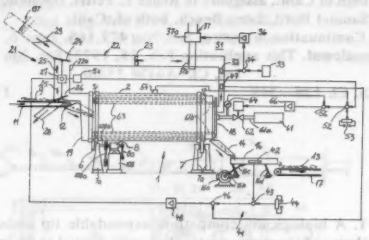
Filed July 25, 1974, Ser. No. 491,867

Claims priority, application Germany, July 27, 1973, 2338129

Int. Cl.² A24B *3/04*

U.S. Cl. 131—135 **7 Claims**

1. A method of reducing the moisture content of a stream of tobacco particles which are transported by a conveyor in a predetermined direction through an elongated conditioning zone into which particles of moist tobacco are admitted at one end and from which particles of dried tobacco are discharged at the other end, comprising the steps of heating the conveyor; passing through the conditioning zone a current of a heated gaseous fluid counter to said direction so that the particles of tobacco are heated by teh conveyor as well as by the fluid and release moisture which is entrained by the fluid; intercepting a portion of moisture-laden fluid at the one end of the conditioning zone and conveying the intercepted portion along a predetermined path into the other end of the conditioning zone; mixing the moisture-laden fluid in said path with a drier fluid while maintaining the quantity of fluid entering said other end of the conditioning zone at least substantially constant; measuring the moisture content of dried tobacco particles; comparing the measured moisture content with a predetermined moisture content; and changing the ratio of moisture-laden fluid to drier fluid in said path as a function of the extent of deviation of the measured moisture content from said predetermined moisture content.



3,978,869

MOUTHPIECE FOR CIGARETTE

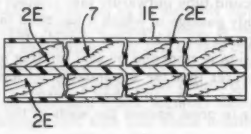
Minoru Uehara; Kazuo Maeda, both of Tokyo; Shoji Fujii, Ichikawa, and Hiromu Nishio, Kamakura, all of Japan, assignors to The Japan Monopoly Corporation, Tokyo and Daicel, Ltd., Osaka, both of, Japan

Continuation of Ser. No. 419,439, Nov. 27, 1973, abandoned. This application June 19, 1975, Ser. No. 589,364

Claims priority, application Japan, Nov. 28, 1972, 47-136791[U]

Int. Cl.² A24F *13/06*

U.S. Cl. 131—261 B **1 Claim**



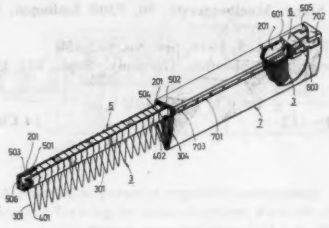
1. A one-piece, extruded, synthetic resin, cigarette mouthpiece having a cylindrical tubular exterior wall of substantially circular cross-section, and four continuous unitary helical deflecting walls within said exterior wall and extending lengthwise from one axial end to the other axial end of said exterior wall, said four deflecting walls in transverse cross-section extending substantially radially inwardly from substantially uniformly circumferentially spaced-apart points on said exterior wall, said deflecting walls being joined to each other at their radially inner ends at the central longitudinal axis of said mouthpiece so that said deflecting walls form a cross in transverse cross-section, said deflecting walls being helically curved along the entire lengthwise extent of said mouthpiece so that all radii of the circular cross-section of the mouthpiece defined by said exterior wall are occupied by portions of said deflecting walls along the length of the mouthpiece, the radially outer edges of said deflecting walls being integral with said exterior wall, said deflecting walls defining within said exterior wall four separate continuous helical flow passages for cigarette smoke so that said cigarette smoke undergoes smooth and gradual direction change as it flows through said passages, said deflecting walls each having axially spaced-apart pleats extending from the junctures of the radially outer edges thereof with said exterior wall part-way across said deflecting walls and also having longitudinally extending corrugations so that each of said deflecting walls has a wavy configuration in transverse cross-section.

3,978,870

COMB WITH DISPOSABLE COMB-TEETH MODULE

Chung Sing Lin, No. 182-2 Chung Shan Road, Shan Hua Chen, Tainan Hsien, Taiwan, China

Filed Aug. 18, 1975, Ser. No. 605,746
Int. Cl.² A45D *24/00*
U.S. Cl. 132—11 R 6 Claims



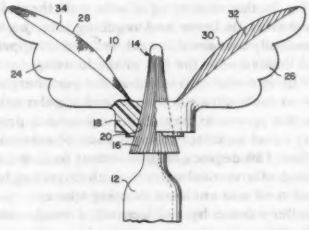
1. A novel comb comprising:
a comb back;
a comb-teeth module detachably mounted on the comb back; and
a case member connected to one end of the comb back for serving as a handle;
charactered in that the comb-teeth module comprises:
a continuous wire wound helically into a plurality of coils in juxtaposition with each coil including a V-shaped lower portion serving as a comb tooth element and a rectangular upper portion defining a channel adapted to snugly receive the comb back therein,
said wire including retainer means at both ends of the wire for engaging the comb back whereby the comb teeth module can be retained on the comb back either in a retracted condition having comb teeth compacted or in an extended condition having comb teeth spaced apart.

3,978,871

NAIL POLISH BOTTLE OPENER AND NAIL CARE IMPLEMENT

Robert B. Huston, Pompano Beach, Fla., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Oct. 1, 1975, Ser. No. 618,318
Int. Cl.² A45D *29/00*
U.S. Cl. 132—73 3 Claims



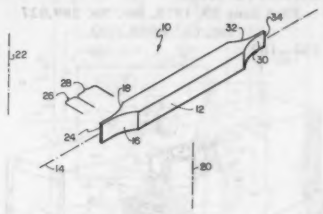
1. A decorative wrench device for opening a nail polish bottle having an upwardly converging cap with a grooved surface comprising: a collar; a generally conical bore in said collar, said bore having a grooved surface for engaging said cap; an arm projecting integrally from said collar; and nail filing means on said arm.

3,978,872

TOOTHPICK

Jesse H. Bond, 1038 Shephard, Corpus Christi, Tex. 78412

Filed Mar. 12, 1975, Ser. No. 557,819
Int. Cl.² A61C *15/00*
U.S. Cl. 132—89 16 Claims



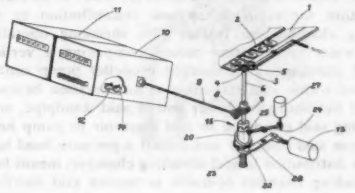
1. A unipartite toothpick comprising an elongate element of an abradable material providing a handle portion having a longitudinal axis, one end of the element being provided with a pair of arcuately converging surfaces of hollow-ground shape, each surface defining a radius about an axis, the last mentioned axes being on opposite sides of the longitudinal axis and being spaced apart a distance in the range of 3–8 inches, the element terminating in a bladed end sufficiently thin to extend between human teeth throughout a distance from the front thereof to the rear thereof.

3,978,873

COIN COUNTING APPARATUS

Erwin Gross, Karlsruhe, Germany, assignor to Standardwerk Eugen Reis GmbH, Germany

Filed July 24, 1975, Ser. No. 598,814
Claims priority, application Germany, July 26, 1974, 2436022
Int. Cl.² G07D *9/00*
U.S. Cl. 133—8 A 6 Claims



1. Apparatus for counting coins comprising a register for recording the number of coins counted, means for transporting coins in single file, a star-wheel arranged adjacent said transporting means having teeth individually receiving a coin, said star-wheel being indexable about its central axis with respect to a null position on the passage of coins therethrough, a freely rotatable shaft fixed at one end to said star-wheel to index conjointly therewith, means for transmitting the indexing of said shaft to said register, a coupling located about said shaft, said coupling comprising a first member secured to said shaft and a second member freely rotatable about said shaft and axially movable thereon, said second coupling member having a cam located about the peripheral surface thereof and an axial extension provided with a radially extending flange, a pivotally mounted lever adapted to tangentially engage said cam, and a pivotally mounted pawl adapted to engage said flange, and means to selectively manipulate said lever to cause said lever to engage said cam to separate said coupling and cause said second coupling member to rotate into the null position about said shaft, and means to selectively manipulate

said pawl to cause said pawl to engage said flange in the null position.

3,978,874

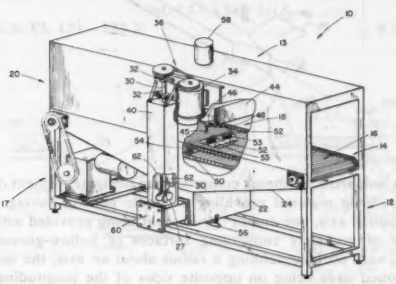
HEAT SENSITIVE FILM SHRINKING MACHINE

Jacob Schmidt, Sr., and Jacob Schmidt, Jr., both of R.D. No. 1, Harleysville, Pa. 19438

Filed June 23, 1975, Ser. No. 589,027

Int. Cl.[2] B08B *3/02*

U.S. Cl. 134—107 2 Claims



1. A heat sensitive film shrinking machine having a supporting frame structure of interconnected vertical and horizontal frame members to support units thereof adapted to recirculate and distribute a heated water medium to shrink heat sensitive film about food product items vacuum wrapped therein during a single pass of said items through said machine, a linked rod conveyor means operable to deliver said items unidirectionally in spaced relationship upon said conveyor through a heated water shrinking chamber of said machine, a water collection and heating means comprising a geometrically shaped water collection tray connected to and communicating with a downwardly disposed geometrically shaped reservoir in which water which has been distributed in the machine is collected, means to reheat said collected water to an elevated temperature for recirculation and redistribution to said shrinking chamber for further film shrinking operations, heated water recirculation means comprising a vertically disposed standpipe, a submerged propeller pump centrally positioned within said standpipe at an elevation below the midpoint but above the lower end of said standpipe, means connecting said standpipe to said reservoir to pump heated water from said reservoir and impart a pressure head to the same for distribution to said shrinking chamber, means below said shrinking chamber operable to receive said distributed water for reheating and recirculation thereof, in combination with a heated water distribution means comprised of a fountain manifold connected to and communicating with said standpipe and disposed longitudinally within said shrinking chamber and also laterally across said shrinking chamber in said machine between the delivery and return courses of said linked rod conveyor, whereby said fountain manifold has a plurality of openings in the upper closure surface thereof operable to deliver an upward coarse droplet sprinkling of heated water to the underside surfaces of said items as conveyed through said shrinking chamber, an upper slotted distribution tray connected to and communicating with said stand pipe above the mid-point thereof but below the upper end thereof and longitudinally extending within said shrinking chamber across the lateral dimension thereof and having a series of parallel transverse slots in the bottom of said tray for downwardly cascaded distribution of heated water to the upper surfaces of said items as conveyed through the shrinking chamber of said machine, said slots in said heated water distribution tray being formed by pairs of "L" shaped flanges each of which has one of the legs thereof downwardly disposed and means to adjust at least one of said flanges transversely relative to the other along the bottom of said distribution tray to vary the width of the slot openings in said bottom of said tray and thereby control the amount and pattern of heated water distributed therefrom in cascading manner.

3,978,875

DISH WASHING MACHINE

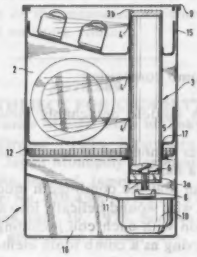
Erich Hans Slany, Muelbergerstr. 90, 7300 Esslingen, Germany

Filed Sept. 5, 1974, Ser. No. 503,450

Claims priority, application Germany, Sept. 11, 1973, 2345705

Int. Cl.[2] B08B *3/02*

U.S. Cl. 134—112 14 Claims



1. A compact, self-contained dish washing machine comprising:

a watertight machine housing including: a bottom, substantially vertical side walls enclosing a space of generally rectangular cross-sectional outline, and a removable matching top cover; the housing further defining in its bottom portion a reservoir space or well and a dry space between its well and the level on which the housing is normally supported if resting on a flat surface;

at least one removable dish rack arranged in said housing so as to be capable of holding dishes and other articles within the spray zone;

a substantially vertically oriented spray pipe arranged inside said housing in the vicinity of a side wall thereof, the spray pipe having its lower end reaching into the water which is normally contained in said well and its upper end closed and located near the top of the housing;

a plurality of spray orifices arranged on the periphery of the spray pipe, at such vertical locations and angular orientations that the sprays exiting therefrom under pressure collectively cover an effective spray zone of substantially no more than 180 degrees angular extent from the spray pipe axis and of a vertical extent which covers at least a major portion of said enclosed housing space;

a pump impeller carried by and journalled inside said immersed spray pipe portion on a vertical impeller shaft;

an electric motor arranged in said dry space underneath the well so as to have its shaft axially aligned with the impeller shaft, the motor shaft extending sealingly through the housing wall which separates the well from the dry space; and

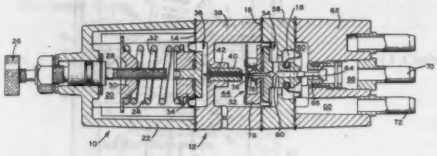
an axially disengageable coupling between the impeller shaft and the motor shaft, the coupling being arranged inside the well, near the bottom thereof.

3,978,876

PNEUMATIC PRESSURE REGULATOR

Thomas E. Stevenson, Willoughby Hills, and Kenneth W. Cohen, Chesterland, both of Ohio, assignors to Bailey Meter Company, Wickliffe, Ohio

Filed May 23, 1975, Ser. No. 580,455
Int. Cl.² G05D *16/06*
U.S. Cl. 137—84 7 Claims



1. A pneumatic pressure regulator comprising:
a housing forming an input chamber, a nozzle chamber, an output chamber, a vent chamber, and a feedback chamber;
a first flexible diaphragm mounted between said input chamber and said feedback chamber to move in response to a pressure difference therebetween;
a second flexible diaphragm mounted between said nozzle chamber and said vent chamber to move in response to a pressure difference therebetween;
a vane and nozzle assembly mounted on said second diaphragm to exhaust fluid from said nozzle chamber to said vent chamber according to the spacing between the vane and the nozzle of said vane and nozzle assembly and provide a pressure difference between said nozzle chamber and said vent chamber;
a coupling member connecting said first diaphragm to said vane to vary the spacing between the vane and the nozzle; and
output means for varying the pressure in said output chamber in response to movement of said vane and nozzle assembly.

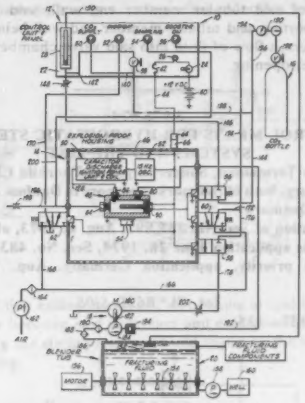
3,978,877

METHOD AND APPARATUS FOR MONITORING AND CONTROLLING THE COMPOSITION OF FLAMMABLE GAS MIXTURES

Bruce M. Cox, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Division of Ser. No. 502,389, Sept. 3, 1974, Pat. No. 3,913,600. This application June 4, 1975, Ser. No. 583,735
Int. Cl.² G05D *11/00*
U.S. Cl. 137—90 9 Claims

1. An apparatus for use with a source of electric current for monitoring and controlling the composition of gaseous mixtures in a substantially closed container to prevent the accumulation of explosive gas mixtures therein, comprising;
a combustion chamber having an inlet and an outlet;
conduit means communicating between said closed container and the inlet of said combustion chamber for conveying a sample stream of gaseous mixture from said container to said combustion chamber;
pump means communicating with said conduit means for propelling the sample gaseous mixture stream through said conduit means to said combustion chamber;
ignition generation means connected with said source of electric current and communicating with the interior of said combustion chamber for providing periodic ignition impulses to the interior of said combustion chamber to ignite any explosive gas mixture therein;
temperature responsive switch means communicating with the interior of the combustion chamber and connected to said source of electric current for regulating passage of electric current therethrough in response to temperatures sensed in said combustion chamber; and
means electrically connected to said temperature responsive switch means and responsive thereto for introducing



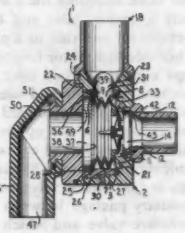
non-combustion-supporting gas into the enclosed container upon the sensing of a temperature within said combustion chamber greater than a predetermined value.

3,978,878

RESILIENT SUPPLY AND EXHAUST VALVE

Hans Rudolph, 7200 Wyandotte, Kansas City, Mo. 64114

Filed Sept. 18, 1975, Ser. No. 614,592
Int. Cl.² G05D *7/00*; F16K *15/14*
U.S. Cl. 137—102 11 Claims



1. A valve device comprising:
a. a valve body having a valve chamber therein and an outlet opening for flow of fluid therethrough, said valve body having a valve seat surrounding the outlet opening;
b. an elongated tubular member positioned in said valve chamber and having one end thereof in sealing engagement with said valve body and in spaced relation with said valve seat, said tubular member having an end wall at the other end thereof and positioned in facing relation with and shaped to engage said valve seat to close said outlet opening, said end wall of said tubular member having ports therein spaced inwardly of said valve seat;
c. a valve element spaced inwardly from said valve seat and comprising a flexible member mounted on the end wall of said tubular member and having a portion thereof seating on said tubular member end wall and around the ports therein to close same, said valve element and said tubular member end wall being adapted to flex in response to fluid pressure in said tubular member to open the ports for flow therethrough; and
d. means extending from said tubular member adjacent said end wall thereof and having a peripheral portion mounted

on said valve body for supporting said tubular member end wall and permitting movement thereof toward and away from said valve seat for seating thereon and unseating of said tubular member end wall, said means for supporting said tubular member end wall being adapted to permit flow of fluid into said valve chamber from the outlet opening.

3,978,879

CONTROL MEANS FOR HYDROSTATIC STEERING SYSTEMS AND THE LIKE

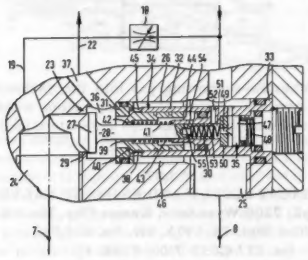
Poul Erik Termansen, Sonderborg, and Thorkild Christensen, Nordborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 385,891, Aug. 6, 1973, abandoned. This application June 26, 1974, Ser. No. 483,115

Claims priority, application Germany, Aug. 14, 1972, 2240012

Int. Cl.² B62D *5/08*

U.S. Cl. 137—115 **3 Claims**



1. A control valve assembly for a hydrostatic steering system comprising a casing, inlet and outlet passages in said casing connectable on one side to a pump and a return tank and on the other side to a motor reversing valve unit, a bypass control passage connecting said inlet and outlet passages, a spring biased check valve for said inlet passage openable for normal operation at a predetermined pressure difference in said inlet passage between the up and downstream sides of said check valve, a spring biased excess pressure valve having fluid communication with said bypass passage, cooperable valve openings in said check valve and in said casing which control a subsidiary passage between said inlet passage and said excess pressure valve and which are aligned when said check valve is open.

3,978,880

REGULATOR VALVE DIAPHRAGM AND VALVE ASSEMBLY INCLUDING THE SAME

Marlyn Dale Crown, and Carl Eugene Finley, both of Sycamore, Ill., assignors to Olin Corporation, New Haven, Conn.

Filed June 23, 1975, Ser. No. 589,295

Int. Cl.² F16K *43/00*

U.S. Cl. 137—315 **3 Claims**

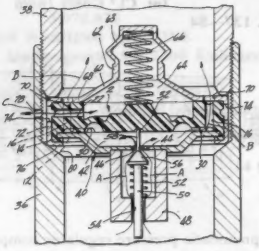
1. A pressure-regulated fluid flow valve assembly comprising: in combination:

a. a housing having at least two components formed of sheet metal;

b. a diaphragm mounted in said housing between said components, said diaphragm dividing said housing into an upstream pressure chamber and a downstream atmospheric chamber;

c. first means forming a plurality of longitudinally extending fluid flow passages extending from said pressure chamber through a radially outermost peripheral portion of said diaphragm and through one of said housing components;

d. second means forming at least one radially extending atmospheric vent passage extending from said atmospheric chamber through said outermost peripheral portion of said diaphragm and through one of said housing components to the surrounding ambient atmosphere, said longitudinally extending flow passages being offset from said radially extending vent passage so as to be sealed from each other; and



e. valve means connected to said housing and including a portion extending into said pressure chamber in contact with said diaphragm, said valve means being operative to control the flow rate of fluid into said pressure chamber in response to variations of pressure in said pressure chamber and sensed by said diaphragm.

3,978,881

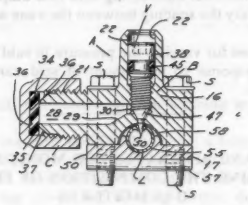
GAS LINE PIERCE VALVE

Edward M. Mouranie, Southfield, Mich., assignor to The Westward Company, Troy, Mich.

Filed June 5, 1975, Ser. No. 584,055

Int. Cl.² F16K *43/00*

U.S. Cl. 137—318 **10 Claims**



1. A valve structure for a refrigerating pipe line comprising a body having a pipe receiving groove on a face thereof, a clamp plate having a face fitting against said body face having a complementary pipe receiving groove, means for clamping said faces together thereby embracing said pipe line in said grooves and securing said valve structure on said pipe line, a stem integral with and projecting from body having an unthreaded cylindrical bore therein with its axis transverse to the axis of said body groove, a nipple projecting from said body having a bore with its axis transverse to and intersecting with the stem bore within said body forming a continuous fluid passageway, said body provided with internal threads in said continuous passageway between said transverse nipple bore and said unthreaded cylindrical stem bore and located in the main portion of the part of said body from which said integral stem projects, a screw valve axially movable within the bore of said stem, said screw valve having a pierce point at the inner end which can be moved through an aperture through the body between said fluid passageway and said body groove, said valve having a conical valve surface adjacent said pierce point for engaging a valve seat surrounding said aperture, said valve having external threads extending outwardly from said valve surface and engaging said internal threads within said body, an enlarged head at the outer end of said valve and entirely within said cylindrical bore of said stem, said head being provided with a circumferential groove, and an O-ring in said circumferential groove of a size to fit within said cylin-

drical stem bore while squeezed between the end shoulders of said groove thereby forming a seal with said cylindrical bore of said projecting stem during axial adjustment of said screw valve.

3,978,882

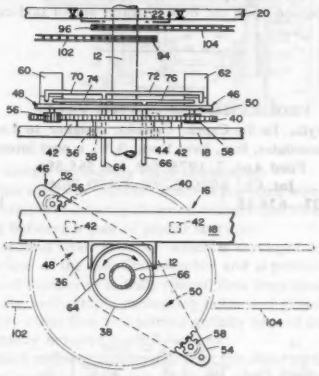
MOVER UNIT FOR IRRIGATION LINE

Gail Cornelius, Portland, Oreg., assignor to R. M. Wade & Co., Portland, Oreg.

Filed Oct. 16, 1975, Ser. No. 622,879

Int. Cl.² B05B *9/02*

U.S. Cl. 137—344 **11 Claims**



1. Apparatus for rotating a wheel-supported irrigation line about its longitudinal axis for travel thereof over a field comprising:

a frame to which the irrigation line is rotatably mounted;

means for supporting the frame;

ring gear means fixed relative to the frame;

arm means fixed relative to the irrigation line and rotatable therewith;

gear means rotatably mounted relative to the arm means and operatively coupled with the ring gear means; and

means for driving the gear means rotatably mounted relative to the arm means so that said driven gear means move about the ring gear means to rotate the arm means and irrigation line.

3,978,883

DEVICE FOR REGULATING THE COMBUSTION AIR OF A FURNACE, ESPECIALLY WITH OIL- OR GASBURNER AND BLOWER FOR HEATING INSTALLATIONS

Jorgen Hartvig Petersen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

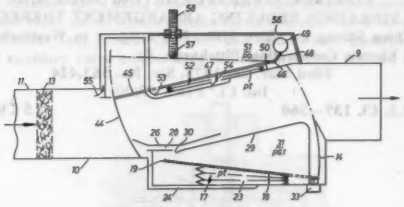
Filed May 2, 1975, Ser. No. 573,865

Claims priority, application Germany, May 6, 1974, 2421873

Int. Cl.² F16K *31/365*; **F01B** *19/02*; **F16J** *3/00*

U.S. Cl. 137—489.5 **8 Claims**

1. A furnace type air throttle assembly having automatic volume control comprising, a conduit having entrance and outlet ends, a chimney at said outlet end of said conduit, blower and oil burner units at said outlet end of said conduit upstream from said chimney, a bellows in said conduit at said entrance end, said bellows having an attached end and a free end, plate means attached to said free end, a housing in said conduit surrounding said bellows, pivot means in said housing, said plate means being attached to said pivot means, carrier arms attached to said pivot means exteriorly of said housing, a movable throttle element attached to said carrier arms, a wall dividing said conduit to form first and second channels with said first channel being adjacent said housing, passage means from said inlet end to the interior of said bellows for communicating thereto the total pressure from said inlet end, said first passage having a cross section reduction followed by



a cross section enlargement, and an opening in said housing in the region between said reduction and enlargement for communicating the static pressure of said region to the interior of said housing.

3,978,884

POSITION REGULATOR

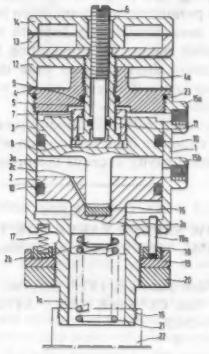
Nils Eskil Sundström, Sodertalje, Sweden, assignor to AB Westin & Backlund, Stockholm, Sweden

Filed Aug. 18, 1975, Ser. No. 605,294

Claims priority, application Sweden, Mar. 24, 1975, 7503346

Int. Cl.² F15B *15/24*

U.S. Cl. 137—495 **5 Claims**



1. A position regulator for a control unit for a pressure medium circuit, the position regulator being operative to cause the control unit to adopt a number of determined positions for adjusting the working pressure of the working medium on the outlet side of the control unit and comprising at least two pistons, a common cylinder in which the pistons are arranged for movement relative to one another and divide the cylinder into a number of pressure chambers for receiving pressure medium supplied in dependence upon control means, and an axial extension provided on one face of at least one piston and extending through the cylinder for co-action with the control unit, the other face of said one piston being formed for co-action with the piston lying therebehind, wherein the improvement comprises stop means fixedly mountably in the cylinder for each separate piston, adjustment means for each stop means for effecting individual adjustment for different lengths of stroke of respective pistons whereby the piston rod or the like providing the output of the cylinder can be caused to adopt a number of axially determined limit positions de-

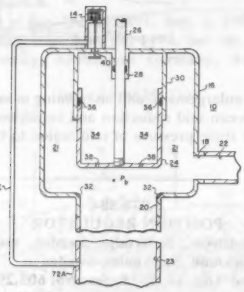
pending upon the control pressure applied to respective pressure chambers.

3,978,885

UNBALANCE PRESSURE ACTUATOR FOR A FLOW CONTROL APPARATUS HAVING NOISE AND VIBRATION REDUCING ARRANGEMENT THEREON

Chien Shiong Lu, Glen Mills, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 28, 1975, Ser. No. 563,424
Int. Cl.[2] F16K *19/00*
U.S. Cl. 137—560 5 Claims



1. In a flow control apparatus having a casing with a valve plug movably disposed therein, an internal cavity disposed within said plug, said plug having a substantially axial bore therethrough permitting communication between said internal cavity and a area immediately beneath said valve plug, and external conduit means for conducting fluid from a region having a pressure therein higher than the pressure beneath said valve plug into said internal cavity, wherein the improvement comrpises:

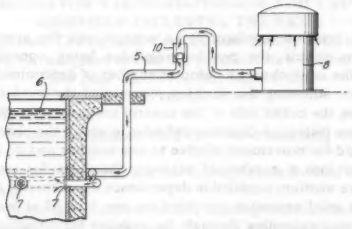
means associated with said conduit means for isolating said internal chamber from said region when said pressure in said internal cavity exceeds the pressure in said region.

3,978,886

BACKFLOW SAFETY VALVE FOR THERAPY POOLS

Cleo D. Mathis, 1808 Potrero Ave., South El Monte, Calif. 91733

Filed June 25, 1975, Ser. No. 590,035
Int. Cl.[2] F16K *15/02*; A47K *3/10*
U.S. Cl. 137—565 1 Claim



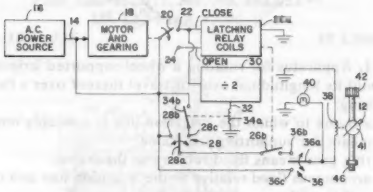
1. An air supply system for a therapy pool comprising an air supply blower, an air supply line connected to and supplied with air from said blower, a plurality of water outlets connected to said air supply line for projecting water into said pool, said water outlets being of the type in which blockage of said water outlets may cause water to enter said air supply line under pressure from a water supply line, a backflow safety valve, said valve being fully automatic in operation, said valve comrising a cylindrical body connected at its opposite ends in a vertical position within said air supply line between said water outlets and said air supply blower, said valve having a valve member comprising an inverted cup mounted for longitudinal movement within said valve body, said cup having a closed end adapted to engage an annular valve seat formed within said valve body adjacent to the closed end of said cup, said cup normally being disposed in an open downward position, said cup being movable upwardly by the pressure of water flowing through said air supply line and into the open end of said cup to move said cup longitudinally upwardly within said valve body into sealing engagement with said valve seat to prevent water from reaching and damaging said air supply blower, said cup automatically returning downwardly to open position upon the flow of water out of said cup.

3,978,887

PROGRAMMABLE WATER VALVE

Ronald Dryla, Ta-Ta Creek, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Apr. 7, 1975, Ser. No. 565,596
Int. Cl.[2] A01G *27/00*; G05D *7/06*
U.S. Cl. 137—624.15 1 Claim



1. A timed water valve responsive to a source of electric power comprising: a water inlet; a water outlet; a solenoid actuated valve means for controlling fluid communication between said inlet and said outlet; elctrical timer means having a 24 hour periodic cycle, said timer means including first and second associated switch means which are respectively closed at sequential predetermined first and second times driving each said cycle, said first time being prior to second time in each cycle; a third normally-open switch means; means for connecting said third switch means in a series circuit with said solenoid actuated valve means and said source of electrical power for controlling the turning on of said valve means; means coupled to said first and second switch means and responsive to the closure of said first and second switch means for closing said third switch means for a first time period beginning at said first time and ending at said second time for enabling said valve to be turned on for said first time period in each cycle; a fourth switch means; divide-by-two means coupled to said first switch means and responsive to the closure of said first switch means for closing and opening said fourth switch means on alternate second time periods of 24 hour length beginning at said first time in one said cycle and ending at said first time in the next said cycle; a fifth manually actuatable switch means for selectively placing said fourth switch means in said series circuit, whereby said valve may be selectively turned on for said first time period only in alternate ones of said 24 hour cycles.

3,978,888

ROTARY MEASURING VALVE

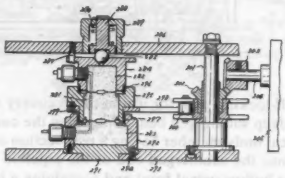
Toyohiko Naono, Akishima, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 387,918, Aug. 13, 1973, Pat. No. 3,933,436. This application Nov. 20, 1975, Ser. No. 633,673

Claims priority, application Japan, Aug. 15, 1972, 47-81709; Aug. 15, 1972, 47-81715; Aug. 15, 1972, 47-81721; Aug. 15, 1972, 47-95684

Int. Cl.[2] F16K *11/02*; G01N *33/16*, *1/14*

U.S. Cl. 137—625.19 1 Claim



1. A sample measuring valve comprising:

a. a first rotatable member which is provided with a plurality of sample measuring channels radially spaced and extending between a pair of planar surfaces;

b. a second fixed member which is arranged to abut one surface of the said first member and is provided with an equal number of radially spaced flow lines corresponding to the said sample measuring holes and grooves around every other flow line joining radially spaced points equal distance between each flow lines;

c. a third member arranged to abut the other surface of said first member and being equipped with an equal number of radially spaced flow lines that correspond to said sample measuring holes, a fluid drawing flow line, fluid introducing flow line, the said fluid drawing flow line and said fluid introducing flow line being arranged astride one of said flow lines and grooves around every other flow line to join radially spaced points equal distance between the flow lines such that the first rotary member may be rotated into a position with its channels communicating with the grooves in said second and third fixed members such that the fluid may be drawn into all of the channels of the rotary member through the fluid introducing flow line by suction applied to the fluid drawing flow line and by rotating the channels they can all be aligned with the corresponding flow lines in the first and second members enabling removal of the measured sample portions of the fluid in each measuring channel of the rotary member.

3,978,889

STEAM SUPPLY CONTROL DEVICE

Shinya Kameda, Tokyo; Shunzaburo Nagashima, Yokohama, and Mikio Obi, Tokyo, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

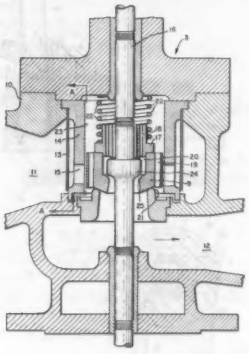
Filed Mar. 20, 1974, Ser. No. 453,037

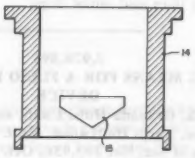
Claims priority, application Japan, Apr. 2, 1973, 48-39831[U]

Int. Cl.[2] F16K *1/00*

U.S. Cl. 137—630.14 1 Claim

1. A control valve having a casing provided with inlet and outlet passages and a central chamber, a port in said casing through which fluid passes from said inlet passage to said chamber, said port being shaped such that the area of opening thereof variably increases from the lower portion toward the upper portion, said control valve comprising a main valve having a cylindrical portion in said chamber and spaced from the wall of the casing to provide a cylindrical passage, said cylindrical portion also providing an interior hollow chamber, a main valve seat, a main valve stem a valve cover secured to the upper portion of said cylindrical portion, a spring interposed between the casing and said valve cover to normally press said main valve against the main valve seat, the diameter of said main valve seat being less than that of said chamber, balance holes extending through the cylindrical portion of said main valve, an auxiliary valve integral with said valve stem, said auxiliary valve being disposed within said hollow chamber of said main valve, balance holes formed in said valve cover to connect said central chamber and said hollow chamber, said auxiliary valve cooperating with a valve seat formed in





said cylindrical portion said auxiliary valve being movable between a closed position when it contacts its valve seat to fully open position where it contacts said valve cover for controlling fluid flow independently of the main valve, said auxiliary valve moving said valve cover, said cylindrical portion and said main valve to move the latter toward open position, movement of said cylindrical portion increasing the area of opening of said port as said main valve is opened to increase the fluid flow from the inlet passage to the central chamber through said cylindrical passage.

3,978,890

FLOW CONTROL CAM

Thomas G. Barnum, Fox Point, Wis., assignor to Bradley Corporation, Menomonee Falls, Wis.

Filed Aug. 4, 1975, Ser. No. 601,922

Int. Cl.[2] F16K *31/32*

U.S. Cl. 137—636.4 4 Claims

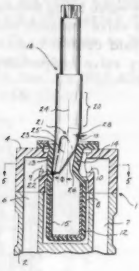
1. A control rod cam for a sleeve type mixing valve that is moved axially to control the volume of flow through valve inlet ports, and that is rotated to control the mixing of the flow through the ports, such cam having:

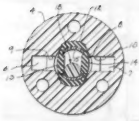
a. a valve closing portion providing port closing surface areas; and

b. a tapered region extending from said valve closing portion that narrows toward a distal end, which tapered region is canted from the axis of said valve closing portion and presents:

i. an initial slope along a dorsal side of the tapered region for allowing opening of a valve port, and

ii. a port closing face along the ventral side of the tapered region that slopes radially outward beyond the surface of said valve closing portion; and





iii. a receding face on said dorsal side which descends from said initial slope to said distal end at an angle greater than said initial slope.

3,978,891

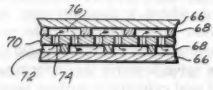
QUIETING MEANS FOR A FLUID FLOW CONTROL DEVICE

Ralph L. Vick, Granada Hills, Calif., assignor to The Bendix Corporation, North Hollywood, Calif.

Continuation of Ser. No. 293,956, Oct. 2, 1972, abandoned. This application May 15, 1974, Ser. No. 470,251

Int. Cl.[2] F16K *47/08;* **F15D** *1/02*

U.S. Cl. 138—42 **7 Claims**



1. A fluid flow controlling device comprising:

a rigid structure comprising a series of stacked laminar members having abutting faces, alternate ones of said members having respective patterns of passageways therethrough, said passageways being in offset but partially overlapping relation to one another and others of said members including means defining a plurality of orifices of substantially smaller effective area than the area of said passageways but aligned with the overlapping parts of pairs of said passageways such that a plurality of generally radial flow patterns are created across said structure with individual passages being defined by a plurality of adjacent said stacked laminar members providing two overlapping passageways and an orifice therebetween, said orifice members being positioned between others of said laminar members and some of said laminar members providing walls confining individual flow patterns such that each such pattern always changes direction to flow across the same orifice member, wherein the pressure drop across said structure is substantially that caused by the orificial losses across said orifices in series.

3,978,892

SELF-LOCKING PLUG APPARATUS FOR SEALING AND RECOVERING A PIPELINE LAID ON A DEEP SUBMERGED BED

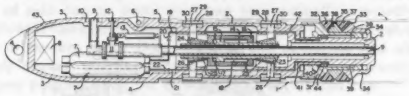
Ambrogio Scodino, San Donato Milanese, Italy, assignor to Saipem S.p.A., Milan, Italy

Filed Apr. 11, 1974, Ser. No. 460,223

Claims priority, application Italy, Apr. 13, 1973, 22952/73

Int. Cl.[2] F16L *55/10*

U.S. Cl. 138—89 **3 Claims**



1. A self-locking plug for use in the recovery of a pipeline laid on a deep submerged bed, comprising the combination of a cylindrical body member having a rear section adapted to be inserted into the submerged end of the pipeline to be recovered and a hollow ogival front end containing a hole adjacent its rear for the reception of a suspension hook and also containing an exhaust port, an exhaust pipe extending along the axis of the cylindrical body member from its rear end to the exhaust port, an exhaust valve for controlling the flow of water through said exhaust pipe and exhaust port, locking means including shoes carried by the cylindrical body member and means for forcing said shoes against the inner wall of said pipeline to anchor the plug into the pipeline, sealing means including a plastic ring seated in a groove in the outer wall of the cylindrical body member and means for squeezing said plastic ring so that it is forced against the inner wall of the pipeline to prevent the flow of water through the pipeline around the plug, compressed fluid carried in container means located in said ogival end, conduits respectively connecting said container means with the locking means and the sealing means, and valves located in said conduits for regulating the admission of compressed fluid to the locking means and the sealing means, said ogival end having a balancing chamber adjacent its front adapted to contain sufficient water to maintain the axis of the cylindrical body member along a substantially horizontal plane when the plug is suspended at a point coinciding with said hole in the ogival end.

3,978,893

APPARATUS FOR DETECTING SUCCESS IN WEFT INSERTION OF SHUTTLELESS LOOMS

Mitsugu Inagawa, Shizuoka, and Isamu Miyazaki, Hamamatsu, both of Japan, assignors to Enshu, Limited, Shizuoka, Japan

Filed Sept. 22, 1975, Ser. No. 615,475

Claims priority, application Japan, Sept. 26, 1974, 49-116452[U]; Nov. 13, 1974, 49-131427

Int. Cl.[2] D03D *51/34*

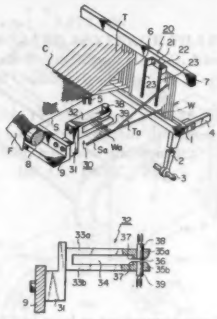
U.S. Cl. 139—370.2 **25 Claims**

1. Apparatus for detecting success in weft insertion on shuttleless looms of the type wherein two sets of angularly separated warp threads (T) and two sets of angularly separated additional warp threads (Ta) laterally displaced from said warp threads are both attached to a common fabric, a weft ejection nozzle on one side of said fabric ejecting a weft thread into open sheds formed by warp threads and additional warp threads, and wherein a lathe moves a reed for beating said weft thread against said warp threads at a cloth-fell line (6) to form said fabric (F), the improvement comprising, in combination,

a displacement mechanism (20) disposed, on the side of the warp threads opposite to the weft ejection nozzle, to the front side of the lathe (1) at a lateral position between the warp (T) and the additional warps (Ta) and having a pair of forks (23) laterally spaced from each other which extend in a direction crossing the plane including the

fabric (F) and movable to a position forwardly of the cloth-fell line at the very moment of cloth-fell beating by the reed for moving the weft end across said cloth-fell line (6) and

a detection mechanism (30) fixed to the loom at a position forwardly of said cloth-fell line and aligned with said displacement mechanism to receive the end of said weft thread and provided with means for photoelectrically



detecting the weft end, a center gap (34) formed forwardly of said photoelectric detecting means, and containing means for retaining the weft end therein,

thereby, forward motion of said forks of said displacement mechanism urges said weft end to move, across said cloth-fell line, into said center gap through the operational zone of said photoelectric detecting means of said detection mechanism.

3,978,894

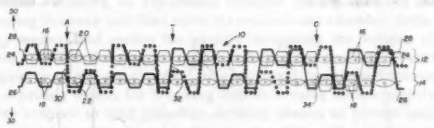
ENERGY ABSORBING TEAR-WEBBING

Jay D. Boone, Seeley, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 5, 1973, Ser. No. 329,502

Int. Cl.² D03D *25/00, 23/00*

U.S. Cl. 139—383 R **6 Claims**



1. In an energy-absorbing tear webbing comprising at least two independent webbing straps each of which are fabricated of a separate system of woven warp yarns and weft yarns, said webbing straps being detachably secured together in a contiguous face-to-face relation by a plurality of pile tear yarns which are woven simultaneously into each strap and between the straps, the improvement residing in each pile tear yarn being alternately woven over a predetermined plurality of adjacent weft yarns in each strap before crossing over to the other strap, the number of the pile tear yarns that cross between the straps gradually increasing from one end of the webbing to another end of the webbing along the length thereof, whereby any force causing a lateral separation of the webbing straps starting from said one end of the webbing will be gradually absorbed in an increasing magnitude as the number of the pile tear yarns to be broken increases toward said another end of the webbing.

3,978,895

DRIVING MECHANISM FOR SELVAGE FORMING KNITTING NEEDLE IN SHUTTLELESS LOOM

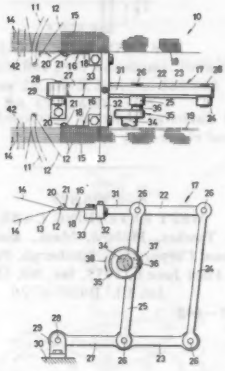
Ryuichi Murasaki, Tateyama, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Dec. 24, 1975, Ser. No. 644,152

Claims priority, application Japan, Dec. 28, 1974, 50-1890

Int. Cl.² D03D *47/42*

U.S. Cl. 139—431 **7 Claims**



1. A driving mechanism for selvage forming knitting needles in shuttleless looms for producing woven fabrics, comprising:

a. a pair of upper and lower horizontal links;

b. a pair of front and rear vertical links, said upper and lower links and said front and rear links being pivotally joined together to provide a substantially parallelogramatic construction;

c. a first link extension extending from said lower link and adapted to be pivotally coupled to a machine frame;

d. a second link extension extending from said upper link and having mounted thereon a knitting needle which is provided with a hook and a shank and is located alongside of the fabric; and

e. means for swinging said links so that said knitting needle is movable between a first position where said hook is raised to engage a loop of weft yarn projected through the shed and a second position where said shank is held vertically stationary adjacent to the fabric fell to knit the loop through the previous loop on the shank when said drive shaft is rotated.

3,978,896

WEFT THREAD INSERTING NOZZLE

Adrianus Johannes Franciscus Larmit, Rootven 12, Moergestel, Netherlands

Filed May 21, 1975, Ser. No. 579,696

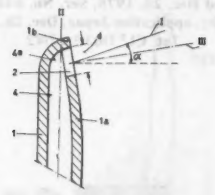
Claims priority, application Netherlands, May 21, 1974, 7406857

Int. Cl.² D03D *47/30, 47/32*

U.S. Cl. 139—435 **2 Claims**

1. A nozzle adapted to be inserted between warp threads into a weaving shed, for discharging a jet of fluid to propel a weft thread at a high speed through a tunnel formed in the weaving shed, comprising a hollow needle for conducting a

fluid under pressure having a discharge outlet in the side wall of the needle, adjacent to the tip of the needle, characterized



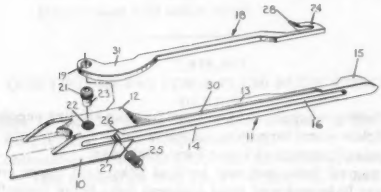
in that said discharge outlet is composed of a plurality of closely spaced elementary apertures.

3,978,897

WEFT EXTENDING CARRIER

Anthony J. Tosches, Milford, Mass., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed June 6, 1975, Ser. No. 584,267
Int. Cl.² D03D *47/20*
U.S. Cl. 139—448 **1 Claim**



1. An improved weft extending carrier for a loom having weft carriers attached to reciprocable inserter members by which weft from an outside source of supply is inserted as single picks into separate sheds of warp threads, the extending carrier receiving an end of weft from an inserting carrier and extending the end of weft across the remainder of the shed, said extending carrier comprising:

a. a base portion for attachment to a reciprocable inserter member;

b. an elongated shank extending outwardly from said base portion in a direction away from the inserter member, said elongated shank having means defining a recess which extends substantially the entire length thereof;

c. an elongated weft finger mounted for pivotal movement into and from said recess;

d. means on that end of said weft finger away from said base portion to define a weft engaging recess and to cooperate with said elongated shank to grip the weft as it is being extended;

e. means biasing said weft finger to a normally closed position within said recess of said elongated shank; and

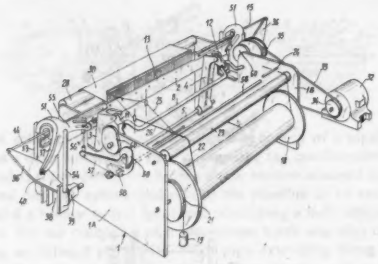
f. said elongated weft finger including an arcuated actuating surface defining a camming surface protruding from said recess for effecting pivotal movement of said weft engaging recess to shed lint accumulation from the latter and said elongated shank and release the weft held therebetween in timed sequence with the weaving cycle.

3,978,898

RAPIER LOOMS

Yves Juillard, Mulhouse, France, assignor to Societe Alsacienne de Constructions Mecaniques de Mulhouse, Mulhouse Cedex, France

Filed Mar. 14, 1975, Ser. No. 558,412
Claims priority, application France, Mar. 15, 1974, 74.08819
Int. Cl.² D03D *47/00*
U.S. Cl. 139—449 **6 Claims**



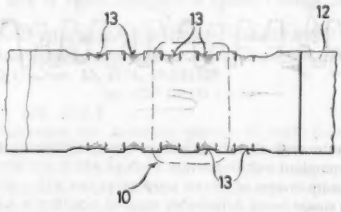
1. A rapier loom comprising at least two rigid weft carriers, rocking lever mechanisms adapted to impart opposed reciprocatory movements to said carriers, a transverse shaft, a sley, two lateral swords carrying said sley, and means mounting said swords for oscillatory movement about said shaft, said sley being constituted by a one-piece hollow beam which extends at each side of said loom beyond the pertaining sley forming two extensions, one at each said side of said loom, and struts rigidly connecting each one of said two extensions to a corresponding extension of said shaft.

3,978,899

CLOSURE FOR A STEEL BAND OR STRAP PLACED AROUND ONE OR MORE ARTICLES AND METHOD AND DEVICE FOR MAKING SAID CLOSURE

Theodor Schröder, Wuppertal-Beyenburg, Germany, assignor to Titan Verpackungs System GmbH, Schwelm, Germany

Filed Mar. 24, 1975, Ser. No. 561,030
Claims priority, application Germany, Mar. 22, 1974, 2413889; Mar. 22, 1974, 2413890
Int. Cl.² B21F *15/04*
U.S. Cl. 140—93.2 **6 Claims**



1. An apparatus for connecting the overlapping ends of a closure band to secure the band ends together in tension transmitting relation which comprises; a pair of cutting devices adapted to receive therebetween the band ends in superposed face to face relation, said cutting devices being operable upon movement toward each other to cut pairs of lateral incisions into the edges of the band ends to form tabs on the band edges between the pairs of said incisions, said cutting devices also bending the tabs out of the planes of the bands to dispose the tabs on the edges of one band end in the space between a respective pair of incisions in the edges of the other

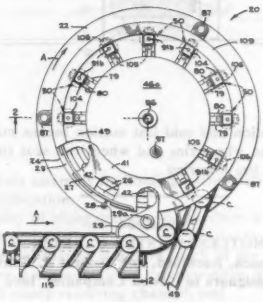
band end, said cutting devices comprising first movable cutting blades engaging one band end at opposite sides of the tab to be formed therein and a second cutting blade engaging the other band end in the region of the tab, said second cutting blade having a nonmovable part engaging the center region of the tab and movable parts on each side of the nonmovable part engaging the side regions of the tab, and means for controlling the movement of said first cutting blades and the movable parts of said second cutting blade.

3,978,900

CARBONATED BEVERAGE FILLER

Samuel A. Mencacci, Saratoga, and Gary O. Niemann, Mountain View, both of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Dec. 17, 1973, Ser. No. 425,587
The portion of the term of this patent subsequent to Dec. 18, 1990, has been disclaimed.
Int. Cl.² B65B *3/04*
U.S. Cl. 141—11 8 Claims



1. An apparatus for filling a carbonated liquid into a container comprising, supply means for maintaining a supply of carbonated liquid under superatmospheric pressure, means defining a variable volume measuring chamber for receiving and confining a predetermined quantity of liquid at said superatmospheric pressure from said supply means, foot valve means for releasing the liquid from the measuring chamber into a container at atmospheric pressure, said foot valve means including an expansible resilient sealing element for sealing between said foot valve means and said chamber defining means, and means for slightly increasing the volume of said chamber defining means for reducing the pressure of said liquid to about atmospheric pressure, said last named means comprising means for lowering said foot valve means slightly with respect to said chamber defining means to permit said sealing element to be moved vertically while still maintaining its sealing effect with said chamber defining means.

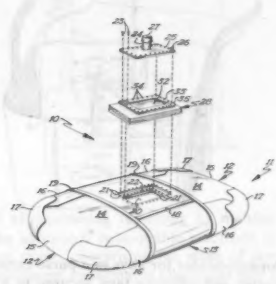
4. An apparatus for filling a carbonated liquid into a container comprising supply means for maintaining a supply of carbonated liquid under superatmospheric pressure; a vertically oriented cylinder connected to said supply means; a foot valve for closing the lower end of said cylinder; a piston mounted for relative movement within said cylinder, said piston and foot valve defining a variable volume measuring chamber within said cylinder for measuring a predetermined charge of liquid for delivery to said container; an inlet valve provided in said piston for permitting flow of said liquid from said supply means to said measuring chamber; means for holding a container to be filled in a position to receive said predetermined charge of liquid from said measuring chamber; and raising and lowering means attached to at least three of said container holding means, said cylinder, said foot valve, said piston and said inlet valve for relatively moving said container holding means, said cylinder, said foot valve, said piston and said inlet valve so that said cylinder is lowered into said container and said inlet valve is closed with said predetermined charge of liquid being in said measuring chamber, said foot valve and cylinder are separated to permit said liquid to flow into said container, said cylinder is raised relative to said container while said container is filled with the lower end of said cylinder remaining beneath the surface of the liquid in the container substantially until the completion of the filling thereof, said cylinder and foot valve are closed and are brought into engagement with said piston to reduce the volume of said measuring chamber substantially to zero, and said inlet valve is opened and said piston is separated from said foot valve to recharge the measuring chamber.

3,978,901

ELASTIC STORAGE TANK

Walter C. Jones, P.O. Box 398, Armstrong, Iowa 50514

Filed June 20, 1975, Ser. No. 588,905
Int. Cl.² B65D *33/16*
U.S. Cl. 150—.5 4 Claims



1. An elastic storage tank for fluid or fluid-like material comprising:

an outer tank member, including a pair of substantially identical end tank sections, each being formed from a single blank of a fiber-reinforced elastomer, each tank section including upper and lower wall portions, each section being defined by a pair of panels, formed by folding the blank along a longitudinal fold line, each tank section including side wall portions extending between and being joined with said upper and lower wall portions, said side wall portions being defined by elongate end panels of said blank which are formed by folding one of the upper or lower wall-defining panels along transverse lines, adjacent opposite ends of said last-mentioned wall-defining panels, each side wall portion having a triangular flap, the other of said upper and lower wall portions having a pair of generally triangular shaped flaps, each projecting therefrom and overlapping and being secured in sealing relation to one of said flaps on a side wall portion, said one upper or lower wall portion having arcuate edge portions, each arcuate edge portion located on the blank between a flap on a side wall portion and a flap on the other upper or lower wall portion, a pair of formed arcuate attachment members, each being secured in sealing relation to the lapped flaps on the side wall portion and on the other of said upper or lower wall portions, and to an arcuate edge portion of said one of the upper or lower wall portions, an intermediate tank section formed from a single blank of fiber-reinforced elastomer, said intermediate tank section having peripheral edges at opposite ends thereof, said end tank sections having a peripheral edge at one end thereof engaging and being secured to the peripheral edge of said intermediate tank section is sealing relation therewith, said intermediate section having an opening therein,

a flexible envelope formed of a film of chemically inert fluid impervious plastic material, said envelope having a shape

corresponding to the outer tank member and being slightly larger in size than said outer tank member,

said envelope having an opening therein registering with the opening in said inner tank member, said envelope having an outturned collar adjacent said opening extending exteriorly of said outer tank member adjacent the opening therein,

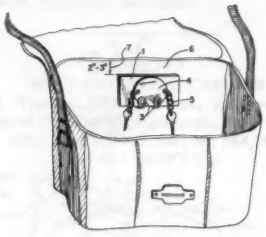
filler means including a filler pipe having an apertured mounting plate secured to the lower end thereof, means securing said plate to the outer tank member to clamp the collar of said envelope in sealed relation therebetween, and closure means for closing said filler pipe.

3,978,902

LOCATOR-HOLDER FOR KEYS

Frances Leedell Adkison, 510-21st St., NW., Washington, D.C. 20006

Filed Dec. 19, 1975, Ser. No. 642,546
Int. Cl.² A45C *1/00*
U.S. Cl. 150—34 **1 Claim**



1. A locator-holder for keys in a purse consisting of a flexible magnetic, self-adhesive tape secured to a purse wall at a point near the purse opening, and adapted to mate magnetically with a steel piece carrying the keys, wherein the magnetic tape is fitted with support means located near the bottom edge of the tape to prevent possible pulling by objects within the purse.

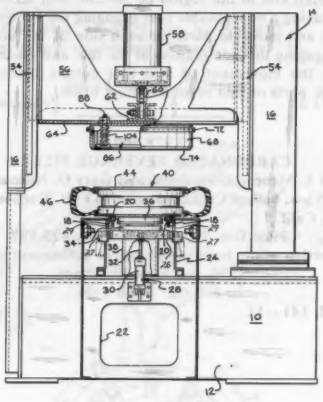
3,978,903

TUBELESS TIRE BEAD SEATER

John L. Mueller, Detroit, and Henry M. Reichert, Roseville, both of Mich., assignors to Sparton Corporation, Jackson, Mich.

Filed Apr. 24, 1975, Ser. No. 571,359
Int. Cl.² B60C *25/06*, *25/08*
U.S. Cl. 157—1.2 **8 Claims**

1. Apparatus for seating tubeless tires having sidewalls and beads upon rimmed wheels comprising, in combination, a vertically extending frame having upper and lower regions, wheel elevating means mounted upon said frame lower region for vertically elevating a horizontally disposed wheel from a lower initial position to an elevated position, seal support means mounted upon said frame upper region above said wheel elevating means, an annular sidewall seal ring mounted upon said seal support means in fixed relation thereto, said ring including an annular free lower edge adapted to sealingly engage a tire sidewall, an annular wheel rim seal ring mounted upon said seal support means within said sidewall seal ring, lost motion means mounting said wheel rim seal ring on said support means permitting relative limited vertical displacement thereon, annular sealing means defined upon said wheel rim seal ring sealingly engaging a wheel upper rim when a wheel is in an elevated position, an annular chamber defined by said sidewall and wheel rim seal rings, compressed air supply means communicating with said chamber, said wheel elevating means including compressible means maintaining an elevating force on the elevated wheel less than the downward force exerted on the tire sidewall during completion of inflation of a tire due to engagement of the sidewall seal ring with the tire sidewall whereby said wheel and tire are lowered



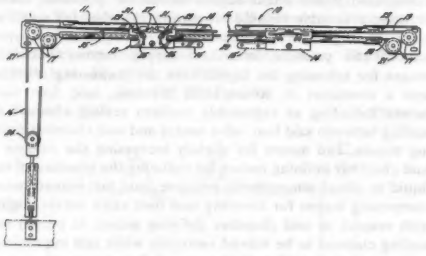
during tire inflation and said lost motion means maintains a seal between the wheel rim and wheel rim seal ring during such wheel and tire lowering.

3,978,904

KNOTLESS MASTER CARRIER

William D. Riebock, Rockford, and Delbert B. Graves, Nora, both of Ill., assignors to Newell Companies, Inc., Freeport, Ill.

Filed May 14, 1975, Ser. No. 577,337
Int. Cl.² A47H *15/00*
U.S. Cl. 160—345 **8 Claims**



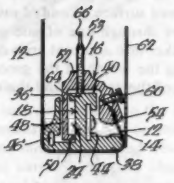
1. In a transverse rod assembly having a support rod, a master carrier slidably supported on said rod, a draw cord threaded along said rod and having at least one free end portion fastened to said master carrier, the improvement in said assembly comprising a finger connected to and projecting outwardly from one side of said carrier, a slot associated with said finger and being formed through said carrier, said slot having one end located adjacent said finger, and a bight formed in said one free end of said cord, around said finger with said one end portion of said cord against the one side of said carrier, said cord being threaded from said bight over said one end portion and then reversely through said slot and along the opposite side of said carrier with said cord being wedged against said one end of said slot thereby anchoring said one end portion of said cord to said carrier.

3,978,905

CANVAS STRETCHER FRAME

Alberto de Lama, P.O. Box 17, Chicago, Ill. 60690, and Joseph Cano, 2033 W. Charleston St., Chicago, Ill. 60647

Filed Sept. 2, 1975, Ser. No. 609,302
Int. Cl.² B44D 3/18
U.S. Cl. 160—378 14 Claims



1. A frame assembly for holding a stretchable web, comprising in combination:

a plurality of elongated frame members with abutting mitered end portions cooperatively positioned to define a polygonal-shaped structure, each of the frame members having a cross-sectional configuration defining an elongated clamp-receiving channel; and

a plurality of clamps permanently coupled to said polygonal-shaped structure, each of said clamps being independently operable of the other and including guide means for slidably engaging said clamp-receiving channel, jaw means for grasping the stretchable web, coupling means connecting the jaw means to the guide means and spaced inward from said frame members within the area bounded by the polygonal-shaped structure, and manually operable means abutting against said frame members and operatively connected to the coupling means for selectively adjusting the tension of the web so as to permit localized stretching and contraction of said web.

3,978,906

PROCESS FOR THE RAPID PRODUCTION OF FOUNDRY MOLDS AND CORES AND TO A COMPOSITION FOR USE THEREIN

Peter Herbert Richard Bryan Lemon, Sherfield, England, assignor to Borden, Inc., Columbus, Ohio

Filed Sept. 11, 1975, Ser. No. 612,363
Claims priority, application United Kingdom, Sept. 24, 1974, 4158/74
Int. Cl.² B22C 9/02, 1/16, 15/10
U.S. Cl. 164—39 6 Claims

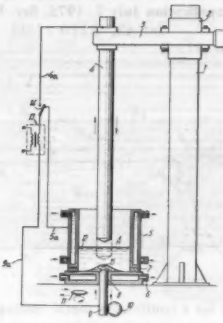
1. A process for the production of foundry molds and cores which comprises coating a granular refractory material with a contact adhesive binder composition comprising a minor proportion of a polymeric material and a major proportion of a tackifier therefor, evaporating volatiles therefrom, comminuting the product, compacting the coated refractory material in or on a pattern mold or core box, removing the mold or core thus formed from the pattern mold or core box and casting metal into the mold or around the core without an intervening curing step.

3,978,907

METHOD OF ELECTROSLAG REMELTING BY MELTING MAIN AND ADDITIONAL ELECTRODES AND MACHINE FOR EFFECTING SAID METHOD

Volf Iudovich Rabinovich, ulitsa Gagarina, 74, kv. 27; Jury Nikolaevich Kriger, ulitsa Oktyabrskaya, 3, kv. 59, both of Chekhov Moskovskoi oblasti; Igor Alexandrovich Svitenko, Teply Stan, 5 mikroraion, korpus 61, kv. 149, Moscow; Viktor Evgenievich Sapunov, ulitsa Gagarina, 52, kv. 44, and Vyacheslav Vasilievich Filippov, 7 kvartal, 10, kv. 36, both of Chekhov Moskovskoi oblasti, all of U.S.S.R.

Filed Mar. 24, 1975, Ser. No. 561,074
Int. Cl.² B22D 27/02
U.S. Cl. 164—52 2 Claims



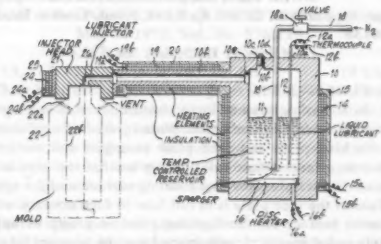
1. A method of electroslag remelting by melting a main electrode and an additional consumable electrode in a mold having a melting space, comprising the steps of introducing said main and additional consumable electrodes into the melting space of said mold, filling a part of the melting space of said mold with slag, cutting-in said mold and additional consumable electrode into an electric current circuit through the slag, heating the additional consumable electrode until it melts off and a metal bath is established, introducing said main consumable electrode into the slag, disconnecting said mold from the current circuit, cutting-in said main electrode into the electric circuit and its melting, and continuing the electroslag remelting process until completion.

3,978,908

METHOD OF DIE CASTING METALS

Elmer E. Klaus, State College, and Chun W. Lai, Wescosville, both of Pa., assignors to Research Corporation, New York, N.Y.

Filed Jan. 6, 1975, Ser. No. 538,568
Int. Cl.² B22D 17/20; B22C 3/00
U.S. Cl. 164—72 39 Claims



1. In a casting operation wherein molten metal is introduced a plurality of times into a mold or die for casting the metal thus-introduced into a corresponding number of objects of a

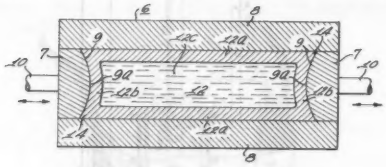
desired shape, including the application of a lubricant to the mold or die surface prior to the introduction of molten metal into contact therewith, the improvement which comprises intermittently applying said lubricant as a vapor to said mold or die surface during the casting operation under conditions such that the lubricant undergoes thermal decomposition on said mold or die surface.

3,978,909

MOLD WITH CONVEX SIDEWALLS FOR CONTINUOUS CASTING MACHINES

Rudolf Schöffmann, Linz, Austria, assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation of Ser. No. 429,702, Jan. 2, 1974, abandoned.
This application July 2, 1975, Ser. No. 592,382
Int. Cl.[2] B22D *11/00*
U.S. Cl. 164—273 R **1 Claim**



1. A mold for a continuous metal casting machine comprising:

a. a plurality of substantially vertical mold walls defining an open ended mold cavity;

b. said plurality of mold walls comprises a pair of vertical planar sidewalls spaced apart in mutually facing parallel arrangement and a pair of end walls narrower than said sidewalls, with said end walls spaced apart in mutually facing parallel arrangement between the sidewalls, said end walls each define a vertical surface which is continuously convex from one of said sidewalls to the other of said sidewalls and with a crest extending between the open ends of the mold, and the adjacent engaging surfaces of said sidewalls and end walls defining four acute included angular corners extending vertically between the upper and lower ends of the open ended mold cavity for casting therein a continuous strand having at least a shell of solidified metal with a pair of oppositely facing flat planar surfaces and a pair of oppositely facing surfaces each defining a continuous concave arch; and

c. at least one of said convex end walls is movable between the flat and planar sidewalls and toward and away from the other of the convex end walls.

3,978,910

MOLD PLATE COOLING SYSTEM

Floyd R. Gladwin, 21000 E. River Road, Grosse Ile, Mich. 48138

Filed July 7, 1975, Ser. No. 593,619
Int. Cl.[2] B22D *27/04*
U.S. Cl. 164—283 M **3 Claims**

1. In a cooling system for a continuous slab-casting mold section, double-thickness mold plate formed of a substantially flat backing plate and face plate arranged and secured together in a face-to-face relationship so that the exposed surface of the face plate forms a molding surface and the opposite surface of the face plate is in full face-to-face contact with the adjacent surface of the backing plate, a group of approximately equal length closely spaced narrow grooves formed in the surface of the face plate and opening toward the backing plate with said grooves being roughly parallel to each other and extending from near the one end to near the opposite end of the face plate;

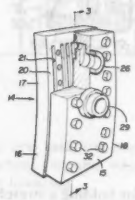
a continuous sealing groove formed in the contacting surface of the backing plate adjacent the margin thereof and surrounding the group of grooves with the sealing groove opening toward the face plate;

a continuous strip of resilient material in said sealing groove;

said grooves being covered by the adjacent backing plate surface whereby the grooves form watercooling channels within the mold plate;

a laterally extending pocket formed in each of the opposite ends of the backing plate contacting surface with each pocket overlapping and opening into all of the grooves at their adjacent ends; and

a pair of internal water-carrying passageways formed in the backing plate, each passageway extending from the backing plate exposed surface to one of said pockets whereby water may flow through one of said passageways and its respective pocket into adjacent ends of all of the grooves and then along the length of the grooves and out of the opposite ends of the grooves and their respective pocket



and passageway for circulation of coolant through the mold plate, the improvment comprising:

the backing plate and face plate each having opposite aligned side edges which are curved in the same direction along the length thereof from one end to the opposite end of each of said plates;

each groove in the surface of the face plate being curved in its longitudinal direction to correspond to the curvature of the side edges of the face plate so that said side edges and the grooves each generally form a successively smaller arc of large radius curves with the arcs approximately parallel to one another; and

said sealing groove being curved in its longitudinal direction along the side edge margin of the face plates and being substantially parallel to the adjacent face plate grooves in a curved path corresponding to the arc of curvature of the side edges of the mold plate;

so that the curvature of both the sealing groove and the water-carrying grooves reduces temperature differentials in the continuous strip of resilient material.

3,978,911

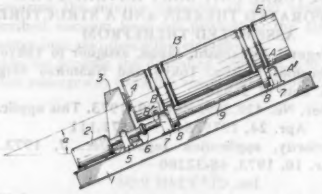
TILTING CENTRIFUGAL CASTING MACHINE

Kazunori Harato; Yoshihiro Sakata, and Yutaka Nishimura, all of Kitakyushu, Japan, assignors to Hitachi Metals, Ltd., Japan

Filed July 20, 1973, Ser. No. 381,005
Claims priority, application Japan, July 31, 1972, 47-75941
Int. Cl.[2] B22D *13/02*
U.S. Cl. 164—286 **6 Claims**

1. A tilting centrifugal casting machine for casting a solid composite roll, the casting machine comprising: a support means, a mold means for receiving the material to be cast into a solid composite roll, means for supporting the mold means on said support means including a pair of spaced parallel shaft means disposed beneath said mold means and extending parallel to the longitudinal axis of said mold means, means for rotatably mounting each of said shaft means on said support means, a pair of spaced roller means provided on each of said shaft means and engaging said mold means, drive means for driving one of said spaced shaft means, a carrier means dis-

posed on said support means for absorbing the thrust of said mold means, the angle of tilt of the casting machine is fixed to a predetermined value selected within the range of from 15° to 23° and an angle made by a line connecting the center of said mold means and the center of said roller means relative to a horizontal plane is fixed to a predetermined value selected within the range of from 35° to 45°, and wherein said mold



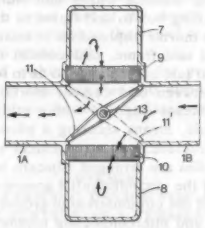
means includes a first end and a second end, said first end being closer than said second end to the apex of the angle of tilt, said carrier means is provided on said support means at said first end of said mold means, and wherein a buffer means is provided on said carrier means for absorbing vibrations of said mold means, said buffer means being interposed between said carrier means and said first end of said mold means.

3,978,912

REGENERATIVE HEAT EXCHANGER

Robert Noel Penny, Solihull, and Peter James Waters, Birmingham, both of England, assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 17, 1974, Ser. No. 506,832
Int. Cl.² F28D *17/00*
U.S. Cl. 165—4 **2 Claims**



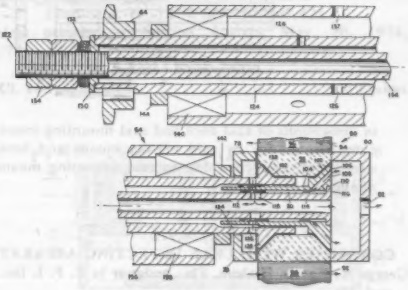
1. A regenerative heat exchanger comprising a pair of ducts defining flow-paths for the separate passage therethrough of fluid between which heat exchange is to be effected, an aperture provided in opposite sides of each duct, a pair of transfer ducts each arranged substantially transversely of said pair of ducts to provide communication between one said aperture in one of said pair of ducts and a corresponding aperture in the other of said pair of ducts, a stationary heat-storing matrix in the form of a substantially flat panel contained in each aperture in one of said pair of ducts, a pair of valve members each in the form of a pivotally mounted plate arranged in one of said pair of ducts and defining a common wall between the flow-paths in the respective duct, and means to effect movement of the valve members between two extreme operable positions, in each of which each said valve member extends obliquely across the respective duct of said pair of ducts, in one of which extreme positions one of the fluids passes through one of said transfer ducts and said matrix associated therewith and the other of the fluids passes through said other transfer duct and said matrix associated therewith and in the other extreme position the fluid flow through the respective transfer ducts and the associated matrices is interchanged, whereby each of said matrices will be heated in succession by the hotter fluid while the other said matrix is imparting heat to the cooler fluid, each said valve member engaging in each extreme operable position an edge of each aperture in the respective duct.

3,978,913

INCINERATOR AND HEAT EXCHANGER STRUCTURE THEREFOR

William A. Phillips, Comstock Park, Mich., assignor to Granco Equipment, Inc., Grand Rapids, Mich.

Filed Sept. 24, 1973, Ser. No. 400,313
Int. Cl.² F28D *19/00*
U.S. Cl. 165—7 **9 Claims**



1. In a fume incinerator having a heat exchanger for hot gases and the like wherein a ceramic wheel has a central core and an annular portion with gas passages extending axially therethrough, mounting means extend through said core for rotation of said wheel about a central axis thereof, and means rotate said mounting means to thereby rotate said wheel, the improvement in said mounting means comprising:

a first wedge member abutting one side of said core and adapted to apply a substantially compressive force to the one side of the core;

a second wedge member abutting an opposite side of said core and adapted to apply a substantially compressive force to the opposite side of the core; and

means for biasing said wedge members together whereby said core is resiliently held substantially under compression between said two wedge members, whereby changes in dimensions of said core and said mounting means are compensated for by said biasing means and tensional stresses on said core due to said mounting means are minimized.

3,978,914

ROTARY CERAMIC HEAT EXCHANGER MOUNTING

William A. Phillips, Comstock Park, Mich., assignor to Granco Equipment, Inc., Grand Rapids, Mich.

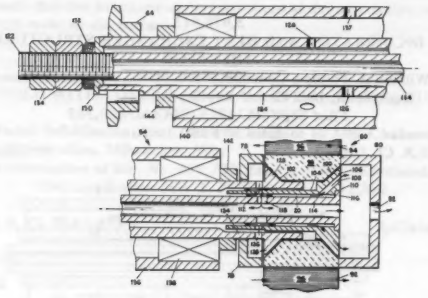
Division of Ser. No. 400,313, Sept. 24, 1973. This application May 9, 1975, Ser. No. 576,215
Int. Cl.² F28D *19/00*
U.S. Cl. 165—7 **10 Claims**

1. In a heat exchanger for hot gases and the like wherein a ceramic wheel has a central core and an annular portion with gas passages extending axially therethrough, mounting means extend through said core for rotation of said wheel about a central axis thereof, and means rotate said mounting means to thereby rotate said wheel, the improvement in said mounting means comprising:

a first wedge member abutting one side of said core and adapted to apply a substantially compressive force to the one side of the core;

a second wedge member abutting an opposite side of said core and adapted to apply a substantially compressive force to the opposite side of the core; and

means for biasing said wedge members together whereby said core is resiliently held substantially under compression between said two wedge members, whereby changes



in dimensions of said core and said mounting means are compensated for by said biasing means and tensional stresses on said core due to said mounting means are minimized.

3,978,915

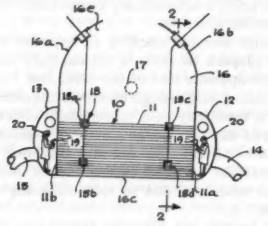
CONDENSER WITH LEAK DETECTING APPARATUS

George A. Harris, Hialeah, Fla., assignor to E. F. I. Inc., Miami, Fla.

Division of Ser. No. 176,479, Aug. 31, 1971, Pat. No. 3,782,180, which is a continuation-in-part of Ser. No. 161,515, July 12, 1971, abandoned, which is a division of Ser. No. 736,917, May 20, 1968, Pat. No. 3,592,967. This application Dec. 28, 1973, Ser. No. 429,347

Int. Cl.[2] G01N *29/00*

U.S. Cl. 165—11 **4 Claims**



1. In a steam generating plant having a closed steam system with a steam condenser for spent steam, the improvement wherein the condenser comprises means constructed of ultrasonic radiation reflecting material defining a closed chamber connected in the steam system to receive spent steam and containing a gaseous medium including a first wall having a plurality of apertures therein, a second wall having a plurality of apertures therein equal in number to the apertures in the first wall, a first header sealed to the first wall spaced from and confronting the apertures in the first wall, a second header sealed to the second wall spaced from and confronting the apertures in the second wall, a plurality of hollow tubes equal in number to the number of apertures in the first and second walls, each tube having one end sealed in one of the apertures of the first wall and the other end sealed in one of the apertures of the second wall, and means mounted within the chamber having a radiator coupled to the gaseous medium in the chamber for generating standing waves of ultrasonic energy within the gaseous medium of the chamber, whereby the apertures in the first wall may be scanned with an ultrasonic detector disposed in the first header and the apertures in the second wall may be scanned with an ultrasonic detector disposed in the second header to determine the magnitude of ultrasonic leakage from the chamber through each of the tubes as an indication of fluid leaks from the chamber or thin spots in the hollow tubes.

3,978,916

STRUCTURAL UNIT BODY HAVING A PIPE INCORPORATED THEREIN AND A STRUCTURE ASSEMBLED THEREFROM

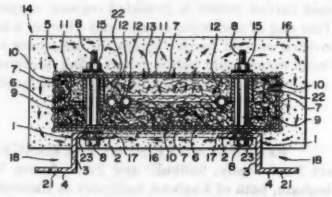
Naomitsu Megumi, Funabashi, Japan, assignor to Tokyo Plywood Kabushiki Kaisha, Tokyo and Naomitsu Megumi, Funabashi, both of, Japan

Division of Ser. No. 420,399, Nov. 30, 1973. This application Apr. 24, 1975, Ser. No. 571,111

Claims priority, application Japan, Dec. 7, 1972, 47-122690; Mar. 10, 1973, 48-32280

Int. Cl.[2] F24H *9/08*

U.S. Cl. 165—49 **5 Claims**



1. A construction arrangement for a structure such as a wall or floor comprising a unit body, said unit body including a frame having an outer flange and an inner flange, said inner flange circumscribing an opening in said frame, a stuffing box, a noncombustible material within said stuffing box, means securing said stuffing box to said frame to thereby close said opening, cement mortar disposed on at least portions of said stuffing box and said frame, said cement mortar being arranged relative to said outer flange so as to form a circumferential groove between said cement mortar and said outer flange, conduit means disposed within said stuffing box for conducting a fluid, means securing a plurality of said unit bodies to said structure in an arrangement whereby said plurality of unit bodies are arranged adjacent to one another so that a portion of the circumferential groove of one unit body faces a portion of the circumferential groove of another adjacent unit body, and interconnecting means disposed in said circumferential grooves for interconnecting said adjacent unit bodies to one another, and connecting pipe means connecting the conduit means of adjacent unit bodies to each other.

3,978,917

DESCALING SYSTEM FOR THE COOLING WATER TUBES OF A STEAM CONDENSER

Yoshio Honma, Yokosuka, and Junichi Takahashi, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki and Toshiba Engineering Co., Ltd., Nishi-shinbashi, both of, Japan

Filed Sept. 5, 1974, Ser. No. 503,315

Claims priority, application Japan, Oct. 22, 1973, 48-121658[U]

Int. Cl.[2] F28G *1/00*

U.S. Cl. 165—95 **4 Claims**

1. A descaling system for cleaning the inner walls of cooling water tubes of a steam condenser by passing a large number of descaling elements through said tubes, comprising:

cooling water tubes of a steam condenser;

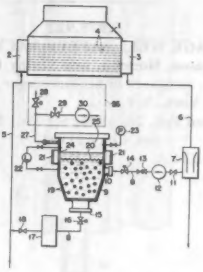
a circulation passageway for cyclically feeding said descaling elements into said cooling water tubes, said passageway having one end connected to a cooling water feed

pipe communicating with one end of said steam condenser and the other end connected to a cooling water discharge pipe communicating with the other end of said steam condenser;

a water soaking vessel provided in said circulation passageway and having a large number of descaling elements disposed therein which are capable of absorbing water;

evacuating means communicating with said vessel for increasing the interior pressure of said vessel to a prescribed vacuum level for promoting the absorbancy of water into said descaling elements,

means for feeding the descaling elements into the circulation passageway from the vessel and for forcibly introducing the same into the cooling water tubes of the steam condenser together with cooling water, thereby cleaning the respective inner walls of the cooling water tubes,



means for determining a limit line level of water to be charged into the vessel whereby a relatively large volume of space is formed between the water level and the vessel ceiling in the upper part of the vessel, said evacuating device being connected to the vessel so as to communicate with said space; and

means disposed within said vessel for preventing a large number of said descaling elements disposed in the vessel from floating upon the surface of said water charged into the vessel.

3,978,918

HEATING AND COOLING DEVICE FOR AN AGITATOR TANK SERVING AS A FERMENTOR

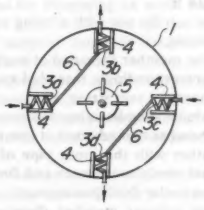
Katuaki Nagatomo; Hiromasa Fukumori, and Hiroyuki Narikiyo, all of Kudamatsu, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 27, 1974, Ser. No. 455,404

Claims priority, application Japan, Mar. 28, 1973, 48-36722[U]

Int. Cl.² F28F *13/12*

U.S. Cl. 165—109 **15 Claims**



15. A heat exchange device in a tank provided with agitator means, said device comprising:

at least one block of plural generally vertical heat exchange fluid conduit means disposed within said tank,

wherein said block extends within said tank in a given direction, and

wherein said conduit means are successively disposed in a staggered manner about a line extending in a radial direction within the tank and the agitator means creates flow substantially normal to the radially extending line so that fluid is in equivalent contact with the conduit means.

3,978,919

COOLER-CUM-BLOWER ASSEMBLY FOR INTERNAL COMBUSTION ENGINES

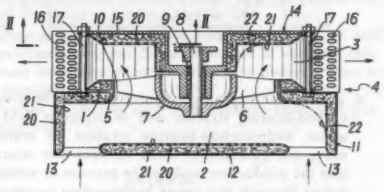
Heinz Fachbach; Gerhard Thien, and Josef Greier, all of Graz, Austria, assignors to Hans List, Graz, Austria

Filed Sept. 19, 1974, Ser. No. 507,421

Claims priority, application Austria, Mar. 20, 1974, 2314/74

Int. Cl.² F28F *13/00*

U.S. Cl. 165—135 **6 Claims**



1. A water cooler-cum-blower unit for water-cooled internal combustion engines, in particular for automotive engines, comprising a housing having a front wall, a back wall and a peripheral wall, a partition located between and parallel to the front wall and the back wall, the partition subdividing the housing into first and second adjoining chambers and having a central circular aperture, an axial blower arranged centrally in said housing and having an impeller provided in said aperture of the partition, said first chamber being located in front of the blower impeller and forming a substantially disc-shaped air-intake shaft connecting an air-intake opening provided in said front wall of the housing with said central aperture of the partition, said second chamber being located behind the blower impeller and forming a substantially disc-shaped air outlet shaft connecting the central aperture of the partition with an air-outlet opening provided in the peripheral wall of the housing, both said disc-shaped air intake and air outlet shafts providing means for effecting a non-axial flow path, both said chambers being lined with sound-absorbing coatings, a water-cooler located in the area of said air-outlet opening and forming at least part of the peripheral wall of the housing.

3,978,920

IN SITU COMBUSTION PROCESS FOR MULTI-STRATUM RESERVOIRS

Pratip Bandyopadhyay, and Vaughan W. Rhoades, both of Tulsa, Okla., assignors to Cities Service Company, Tulsa, Okla.

Filed Oct. 24, 1975, Ser. No. 625,416

Int. Cl.² E21B *43/24*

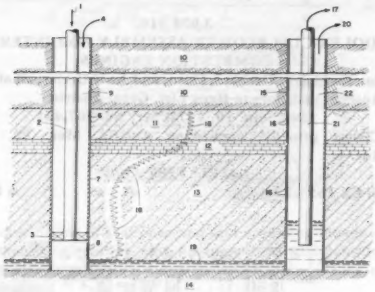
U.S. Cl. 166—258 **10 Claims**

1. In a subterranean hydrocarbon-bearing formation comprising an upper permeable hydrocarbon-bearing stratum overlying a lower permeable hydrocarbon-bearing stratum and separated therefrom by a semi-permeable stratum which is substantially permeable to oxygen but not substantially permeable to water; a process for recovering the hydrocarbons from the hydrocarbon-bearing strata comprising;

a. vertically traversing the strata with an injection well and a production well,

b. igniting the lower hydrocarbon-bearing stratum at the locus of the injection well,

c. injecting an oxygen-containing gas into the lower hydrocarbon-bearing stratum to combust the hydrocarbon therein at the locus of the injection well and to form a combustion front,



d. injecting an oxygen-containing gas into the lower hydrocarbon-bearing stratum and an aqueous fluid into the upper hydrocarbon-bearing stratum to maintain and move the combustion front between the injection well and the production well and to prevent or mitigate channeling through the upper hydrocarbon-bearing stratum, and

e. recovering hydrocarbons from the hydrocarbon-bearing strata.

3,978,921

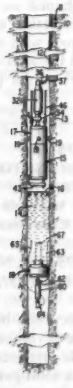
APPARATUS FOR CRYOTHERMAL FRACTURING OF ROCK FORMATIONS

Sigmund L. Ross, Brooklyn, N.Y., assignor to Rose Shuffman, Scarsdale, N.Y.

Continuation-in-part of Ser. No. 148,048, May 28, 1971, Pat. No. 3,759,329, which is a continuation-in-part of Ser. No. 823,306, May 9, 1969, Pat. No. 3,581,821. This application Nov. 14, 1974, Ser. No. 523,887

Int. Cl.[2] E21B *23/04, 43/26*

U.S. Cl. 166—57 **6 Claims**



6. Apparatus for use in cryogenic fracturing of a rock formation surrounding a hole which comprises an anchoring device adapted to be lowered to desired position in said hole, said anchoring device comprising gripping means movable laterally relative to the axis of said hole, means actuatable for moving said gripping means into gripping relation with the wall of the hole to anchor said anchoring device in said hole and for return of said gripping means to non-gripping relation to said hole, an elongated tank supported by said anchoring device adapted to be lowered into said hole having an outlet adjacent its lower end in advance of said anchoring device, a valve for controlling discharge of cryogenic liquid through said outlet, and means for opening said valve to release cryogenic liquid from said tank through said outlet underneath said anchoring device when said anchoring device is anchored to the side wall of said hole by said gripping means, said tank comprising articulating means at an intermediate position between the ends thereof.

3,978,922

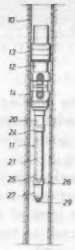
GAS STORAGE WELL SAFETY VALVE APPARATUS

Joseph L. Johnson, Houston, and Shelby L. Guidry, Conroe, both of Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Feb. 26, 1975, Ser. No. 553,348

Int. Cl.[2] E21B *43/12*

U.S. Cl. 166—224 A **10 Claims**



1. In combination with a safety valve apparatus provided with a dome reference pressure and valve means that is moved from open to closed position in response to a decrease in flowing pressure in a conduit adjacent said valve means to a value that is below said dome reference pressure, flow restriction means in said conduit upstream of said valve means for causing a drop in flowing pressure adjacent said valve means to a value that is below said dome reference pressure in response to abnormal conditions in said conduit downstream of said valve means.

3,978,923

INJECTION SUB FOR DUAL TUBE DRILLING

George Alan Ford, Houston, Tex., assignor to Walker-Neer Manufacturing Co., Inc., Wichita Falls, Tex.

Filed Oct. 14, 1975, Ser. No. 621,655

Int. Cl.[2] E21B *43/00, 21/00*

U.S. Cl. 166—224 R **5 Claims**

1. An injection sub for use with a string of dual concentric drill pipe, comprising:

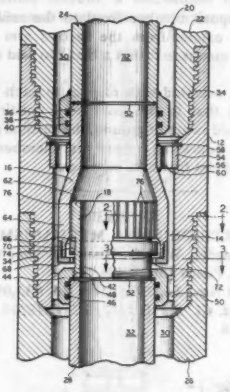
an outer tubular member threaded at each end for engagement with correspondingly threaded ends of outer pipes of two segments of said string;

a first inner tubular member disposed concentrically within said outer member and adapted at one end for telescopic interconnection with the inner pipe of one of said segments of said string, said outer and first inner members defining an annular fluid passageway;

a sceond inner tubular member disposed concentrically within said outer member and adapted at one end for telescopic interconnection with the inner pipe of the other of said segments of said string, the other end of said

second inner member being adapted to fit snugly within the other end of said first inner member in coaxial alignment therewith to form a continuous fluid conduit through said inner members and inner pipes;

an annular chamber defined between the outer surface of said second inner member and the inner surface of said first inner member;



an annular valve seat extending between said first and second inner members and adapted to isolate said chamber from said annular passageway, said seat including port means to permit fluid communication between said annular passageway and said chamber;

valve means in said chamber to open and close said port means; and

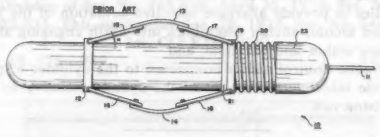
a plurality of apertures providing fluid communication between said chamber and said conduit.

3,978,924

HIDDEN BOW SPRING FOR CALIPERS AND CENTRALIZERS

Raymond E. Roesner, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 28, 1975, Ser. No. 626,606
Int. Cl.² E21B *17/10*; G01B *5/12*
U.S. Cl. 166—241 **6 Claims**



6. An apparatus for traversing an earth borehole, comprising:

an elongated support member adapted for movement through an earth borehole;

a borehole-engaging member constructed to move along the wall of the borehole;

a first arm member connected between said borehole-engaging member and a fixed pivot point on said support member;

a second arm member connected between said borehole-engaging member and a slidable pivot point on said support member; and

a bow spring having first and second ends, one of said spring ends being fixedly attached to the underside of one of said arm members and the other of said spring ends being slidably attached to the other of said arm members, said bow spring being positioned to push against the underside of said borehole-engaging member.

3,978,925

METHOD FOR RECOVERY OF BITUMENS FROM TAR SANDS

David A. Redford, Fort Saskatchewan, Canada, assignor to Texaco Exploration Canada Ltd., Calgary, Canada

Filed June 21, 1974, Ser. No. 481,582
Int. Cl.² E21B *43/24*
U.S. Cl. 166—261 **10 Claims**

1. A method for the recovery of hydrocarbons from subterranean hydrocarbon-bearing formations traversed by at least one injection well and one production well and having fluid communication therebetween, comprising the steps of:

a. injecting via said injection well into said communications path a mixture of steam and an oxygen-containing gas, said mixture being injected at a temperature in the range of 250°-500°F., thereby generating a low temperature oxidation therein,

b. continuing injection of said mixture until unreacted oxygen is produced at said production well,

c. shutting in said two wells to allow the oxygen of said oxygen-containing gas to be consumed in said low temperature oxidation reaction with said hydrocarbons in said formation,

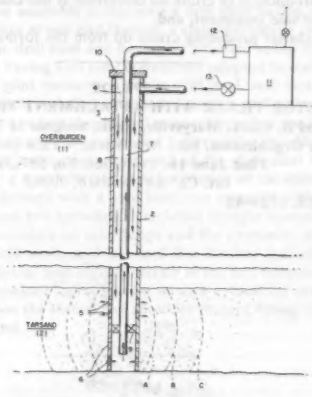
d. thereafter producing said hydrocarbons from said production well.

3,978,926

RECOVERY OF BITUMENS BY IMBIBITION FLOODING

Joseph C. Allen, Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.

Filed May 19, 1975, Ser. No. 578,560
Int. Cl.² E21B *43/00*
U.S. Cl. 166—267 **6 Claims**



1. A method for in-situ recovery of bitumen from tar sand deposits by sequential extraction at ambient temperature deposit comprising the steps of;

a. contacting a portion of said tar sand deposits with a paraffin liquid hydrocarbon solvent,

b. allowing said solvent to remain in contact with said portion of said tar sand deposit and imbibe into said deposit thereby dissolving said bitumen,

c. producing said bitumen and solvent mixture,

d. again contacting said tar sand deposit with said mixture to dissolve additional bitumen,

e. producing said mixture,
f. repeating steps (d) and (e) until said bitumen and solvent mixture becomes highly diluted with said bitumen,
g. separating said bitumen from said mixture thereby recovering said bitumen.

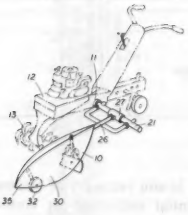
3,978,927
ALKOXYLATED ASPHALTS AS SACRIFICIAL AGENTS IN OIL RECOVERY PROCESSES
Mohan V. Kudchadker, and Thad O. Walker, both of Houston, Tex., assignors to Texaco Inc., Houston, Tex.
Filed Sept. 10, 1975, Ser. No. 612,118
Int. Cl.[2] E21B *43/16*
U.S. Cl. 166—273 **9 Claims**

6. In a method for recovering oil from a subterranean formation containing oil and having an injection well and a production well wherein a surfactant solution is injected into the injection well in order to drive the oil to the production well where it is produced the improvement which comprises:
injecting into the injection well prior to the surfactant an aqueous solution of ethoxylated asphalts.

3,978,928
PROCESS FOR THE PRODUCTION OF FLUIDS FROM SUBTERRANEAN FORMATIONS
Richard L. Clampitt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Apr. 14, 1975, Ser. No. 567,958
Int. Cl.[2] E21B *43/02*
U.S. Cl. 166—294 **13 Claims**

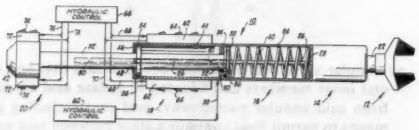
1. A process comprising:
treating a subterranean formation having at least one borehole with an aqueous gel, wherein crude oil and water were produced from said subterranean formation through said borehole until the production of crude oil was reduced due to the presence of sandy material restricting said borehole, so that the sandy material restricting the borehole is controlled as a result of said treatment and the production of crude oil therefrom is increased as a result of said treatment; and
thereafter producing crude oil from the formation.

3,978,929
ROTOR TILLER WITH ATTACHMENT THEREFOR
Samuel H. Clark, Marysville, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed June 16, 1975, Ser. No. 587,310
Int. Cl.[2] A01B *33/16, 33/02*
U.S. Cl. 172—42 **4 Claims**



1. In combination with a rotor tiller machine, said machine including a frame with handle bar means extending rearwardly therefrom for guidance of said machine by a walking attendant, said machine further including rotary tiller blade means forwardly of said handle bar means for cultivating a swath of ground as said machine travels forwardly over the ground, an attachment assembly mounted on said rotor tiller machine and extending alongside of and away from the rotor tiller machine for the purpose of preparing a swath of ground adjacent to the swath cultivated by the rotor tiller,
said assembly comprising a first arm member fixed to a side of said frame of said rotor tiller machine and projecting away from said frame of said rotor tiller machine, a second arm member rotatably hinged to the first arm member so as to extend away from said first arm member in the direction of forward travel of said rotor tiller machine,
a vertical support member fixed to the said second arm member to extend from the second arm member, together with means to fasten a blade to said support member,
said members oriented with respect to each other on said machine so that in the assembled position of use for preparing said swath of ground, the vertical support member extends below the second arm member in a position forwardly of the first arm member.

3,978,930
EARTH DRILLING MECHANISMS
Rondon L. Schroeder, Wichita, Kans., assignor to Continental Oil Company, Ponca City, Okla.
Filed Nov. 14, 1975, Ser. No. 632,092
Int. Cl.[2] E21B *3/12;* **E21C** *19/00*
U.S. Cl. 175—94 **5 Claims**

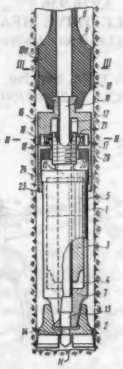


1. An improved apparatus for drilling a borehole, comprising;
a drill head including a drill bit and drill motor for powering the drill bit;
a housing including a force accumulator affixed to the drill motor;
a piston including a piston rod extending in sliding engagement with the force accumulator;
a cylinder around the piston and adapted for bi-directional movement along the piston rod;
at least one first anchor assembly disposed on the outer periphery of the cylinder;
at least one second anchor assembly disposed about the outer periphery of the piston rod;
hydraulic control means connected to the anchor assemblies to provide alternate selective actuation of the first and second anchor assemblies into earth engaging affixture within said borehole; and
hydraulic control means connected to the cylinder to provide selective movement of the cylinder relative to the piston rod.

3,978,931
AIR-OPERATED DRILLING MACHINE OR ROTARY-PERCUSSIVE ACTION
Boris Vasilievich Sudnishnikov, Krasny Prospekt, 56, kv. 59; Veniamin Viktorovich Kamensky, ulitsa Derzhavina, 19, kv. 70; Eduard Petrovich Varnello, ulitsa Dzerzhinskogo, 3, kv. 19; Sergei Konstantinovich Tupitsin, ulitsa Zorge, 123, kv. 31, and Boris Vladimirovich Nazarov, ulitsa Meditsinskie kadry, 4, kv. 18, all of Novosibirsk, U.S.S.R.
Filed Oct. 30, 1975, Ser. No. 627,033
Int. Cl.[2] E21B *1/06*
U.S. Cl. 175—99 **1 Claim**

1. An air-operated drilling machine of rotary-percussive action, incorporating an arrangement for retaining the machine in operation from rearward motion and rotation, the

machine comprising: a housing; a drilling tool accommodated on the head part of said housing and rigidly secured thereto; a hammer received within said housing and defining therewith a front working chamber and a rear working chamber, adapted for reciprocation under the action of compressed air and for effecting percussive action onto said drilling tool; a sleeve adjoining the tail portion of said housing, the latter being connected with said sleeve for rotation and axial displacement relative thereto; a mechanism for rotating said drilling tool, situated intermediate said sleeve and said housing; means for carrying away slime sludge from the borehole being drilled; said drilling tool rotating mechanism including a helicoidal couple with a helicoidally threaded rod rigidly secured to the tail part of said housing and a nut, and a free-wheeling clutch of which the movable cage is made integral with said nut; so that with said hammer delivering a blow upon said drilling tool, the latter strikes against the rock of the face of the borehole and recoils therefrom, whereby said tool with said housing and said helicoidally threaded rod are driven rearwardly from the face, in which way rotation of said drilling tool is effected.



3,978,932

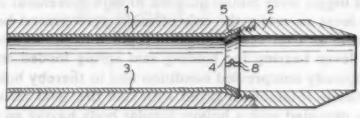
APPARATUS AND METHOD FOR OBTAINING UNDISTURBED SOIL CORE SAMPLES

Lloyd N. Mielke, Lincoln, Nebr., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 465,650, April 30, 1974, Pat. No. 3,872,935. This application Jan. 28, 1975, Ser. No. 544,995

Int. Cl.² E21B *9/20*

U.S. Cl. 175—249 **3 Claims**



1. In an apparatus for collecting undisturbed soil core samples of the type comprising a cylindrical tube or sampler body, open at both ends, and having at one end thereof a cutting tip which is sharpened for facilitating entry into the ground, an improvement comprising a tubular lining of flexible heat-shrinkable plastic open at both ends, contained within said sampler body, and having an outside diameter which is essentially equal to the inside diameter of said sampler body, said sampler body having an annular groove on the inner wall positioned near the cutting tip end; and a compressible, resilient retaining ring positioned in said annular groove and having a compressed outside diameter the same as the diameter of said annular groove for holding said tubular lining in place.

3,978,933

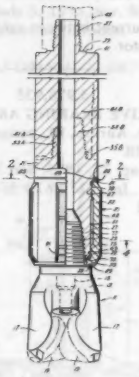
BIT-ADJACENT STABILIZER AND STEEL

Wallace Fred Olson, and James Clifton McNeal, both of Midland, Tex., assignors to Smith International, Inc., Houston, Tex.

Filed Jan. 27, 1975, Ser. No. 544,069

Int. Cl.² E21B *11/00*

U.S. Cl. 175—325 **14 Claims**



1. Drill stem assembly comprising a drill steel having a tool joint connection at one end thereof, a stabilizer sleeve around said end of the drill steel and having an inturned radial flange, and a drill bit having tool joint connection adapted to make up with the tool joint connection of the drill steel, said tool joint connections each including a threaded portion and a shoulder so as to make a rotary shouldered connection when made up, said stabilizer flange being clamped between the shoulders of said tool joint connections, said end of the drill steel being provided with a tool joint pin and the interior of the stabilizer sleeve being formed with a tool joint box engaged with said pin, said pin and box including correlative straight threads and correlative shoulders on said flange and the extremity of said end of the drill steel, said pin and box further including a smooth cylindrical land on the interior of the box between the thread and shoulder thereof and a smooth cylindrical area on the pin between the thread and shoulder thereof fitting snugly within said land.

3,978,934

AMUSEMENT RIDE POWER

Carl Schneidinger, Rolling Hills Estates, Calif., assignor to Jon Daugherty; Jay J. Sarno and Carl Schneidinger, all of Las Vegas, Nev.

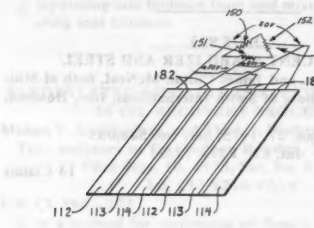
Filed Aug. 30, 1974, Ser. No. 502,177

Int. Cl.² B60L *9/08*

U.S. Cl. 180—2 **12 Claims**

1. The combination with a source of polyphase electrical alternating current of: A floor being composed of a number of strips of electrical conductive material alternately connected to different legs of the alternating current source; an entertainment vehicle for travelling upon said floor; A direct current motor operatively connected to said vehicle; a multiplic-

ity of electrical contact elements carried by said vehicle in contact with said floor; circuitry for rectifying said alternating



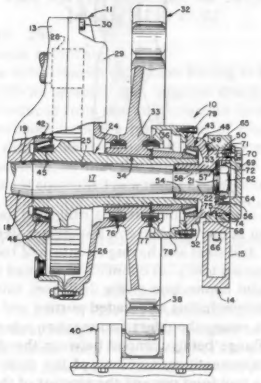
current to direct current between said electrical contact elements and said motor.

3,978,935

FINAL DRIVE BEARING ARRANGEMENT

Fred R. Dauwalder, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 27, 1975, Ser. No. 608,295
Int. Cl.² B62D *55/12*
U.S. Cl. 180—9.62 **9 Claims**



1. In a crawler tractor having a case, a track frame disposed in laterally spaced relation to said case, and a final drive assembly mounted to the case and having a nonrotatable sprocket shaft extending laterally between the case and the track frame, a track driving sprocket and an elongated hub carrying such sprocket, a bearing arrangement wherein the improvement comprises;

a pair of tapered roller bearings for rotatably mounting the hub in spaced coaxial relation about said sprocket shaft with one of said bearings being mounted between said case and the adjacent inner end of said hub and the other of said bearings being mounted on the outer end of said hub;

a threaded distal end portion on said shaft adjacent said track frame;

a cylindrical portion on said shaft adjacent said distal end portion;

an annular bearing cage for supporting said outer bearing, said bearing cage including an inner sleeve portion positioned in close radially supporting relation about said cylindrical portion of the shaft, said sleeve and cylindrical portions being cooperatively uniformly sized to permit sliding movement of the bearing cage along the shaft for providing an axial floating relationship therebetween; and

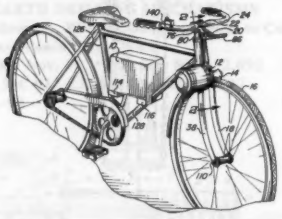
a nut adjustably screw threadably mounted on said distal end portion of the shaft in axial engagement against said bearing cage , said nut being selectively screw threadably tightened against said bearing cage to apply a predetermined axial load thereto, which axial load, due to the axial mobility of the cage relative to the shaft, is freely transmitted through the cage for applying a predetermined axial preload on said bearings.

3,978,936

BICYCLE DRIVE MEANS

Theodore F. Schwartz, 11660 St. Andrews Way, Scottsdale, Ariz. 85254

Filed July 11, 1974, Ser. No. 487,624
Int. Cl.² B62D *61/00*
U.S. Cl. 180—31 **1 Claim**



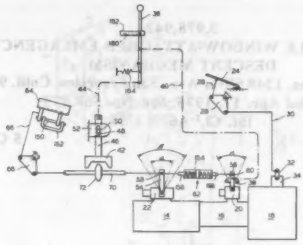
1. A bicycle drive means comprising: a motor having a power output shaft extending therefrom; a bicycle tire engaging rotor fixed on said shaft; a bicycle front fork; a front wheel having a horizontal axis and mounted on said fork; a motor mount on said fork; said motor pivotably mounted on said motor mount on a second horizontal axis parallel to that of said wheel; a tire on siad wheel; said tire having a conventional periphery; said wheel engaging rotor being movable into and out of engagement with said tire by respective pivotable movement of said motor on said motor mount about said second horizontal axis; a telescopic spring loaded strut having a lower end pivot portion pivotably mounted on said motor on a third horizontal axis; a toggle lever; said strut having an upper pivotal bearing portion pivotably mounted on said toggle lever on a fourth horizontal axis; a toggle lever mount for said toggle lever; a bicycle handle bar secured to said front fork; said toggle lever mount secured to said bicycle handle bar; a toggle lever bearing pivotably mounting said toggle lever on said toggle lever mount on a fifth horizontal axis; and stop means on said toggle lever mount adapted to limit movement of said toggle lever to retain the axis of said upper pivotal bearing portion in an over center position relative to the axis of said toggle lever bearing for holding said spring loaded strut in telescopically compressed condition and to thereby hold said rotor firmly rotatably engaged with said tire; said telescopic strut is provided with a hollow tubular body having an upper end on which is fixed said upper pivotal bearing portion; said tubular body having a lower open end; a spring in said hollow tubular body; a plunger extending telescopically into said body through said open end thereof; said plunger having a spring engaging end abuted to said spring; said spring tending to force said plunger outwardly from said open end of said body; said plunger having an annulus in its periphery; said body having a detent projecting into said annulus to limit outward movement of said plunger relative to said open end of said body to allow said toggle lever to retract said rotor away from said wheel when said toggle lever is pivotably moved in a direction away from said stop means.

3,978,937

HYDROSTATIC PROPULSION SYSTEM

Willard L. Chichester, and Donald A. Holtkamp, both of Battle Creek, Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Sept. 23, 1974, Ser. No. 508,588
Int. Cl.² F16H *39/46*; B60K *17/34*
U.S. Cl. 180—44 F 30 Claims



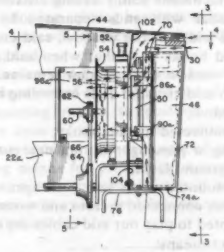
1. In a hydrostatic drive system for a vehicle having a prime mover, first and second traction means, and first and second hydraulic motor means for driving respective ones of said traction means, first and second variable displacement hydraulic pump means driven by the prime mover means for driving respective ones of the hydraulic motor means, said first pump means having a fluid discharge capability greater than the fluid discharge capability of said second pump means, and control means limiting the fluid discharge of said first pump means substantially to the fluid discharge of said second pump means under a first vehicle operating condition.

3,978,938

COMBINED AIRFLOW WITH FRONT MOUNTED FUEL TANK

Alfred J. Joscher, Lombard, and Theodore F. Boone, Tinley Park, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed June 5, 1975, Ser. No. 584,247
Int. Cl.² B60K *11/04*, *15/02*
U.S. Cl. 180—68 R 7 Claims



1. In a tractor vehicle having a pair of longitudinally disposed main frame members which support an engine at a forward portion of the tractor, a fuel tank mounted upright in said forward portion of said tractor, a radiator for cooling said engine mounted between said fuel tank and said engine, an oil cooler mounted to said fuel tank between said tank and said radiator and a system of baffles to direct a flow of air through said radiator and said oil cooler, the improvement comprising:

a vertically disposed main frame appendage having parallel sides permanently affixed to each of said frame members and a cross piece connecting the upper extremities of each of said parallel sides of said frame appendage;

a hood component on the upper portion of said forward portion of said tractor covering said vehicle engine, said fuel tank, said radiator, and said oil cooler and further covering and fixedly attached to said main frame appendage;

a pair of side walls positioned between said main frame and said hood component;

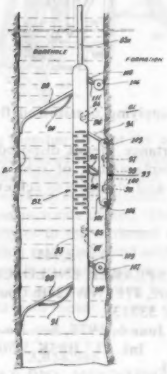
said side walls being equipped with air flow directing ducts for allowing air flow to said radiator.

3,978,939

ACOUSTIC WELL LOGGING METHODS AND APPARATUS

Jean-Claude Trouiller, Chaville, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 256,075, May 23, 1972, abandoned.
This application July 5, 1974, Ser. No. 486,076
Claims priority, application France, May 24, 1971, 71.18638
Int. Cl.² G01V *1/40*, *1/02*
U.S. Cl. 181—104 23 Claims



1. A structure adapted for use in investigating earth formations comprising:

a. a longitudinally extending support member adapted for movement through a borehole; and

b. transducer means adapted to be supported by said support member and having an energy responsive surface, a section of said surface of said transducer means defining a curved line along a plane which extends longitudinally and radially with reference to said longitudinally extending support member, said section being principally associated with energy directed generally radially thereto.

3,978,940

ACOUSTIC SOURCE

John V. Bouyoucos, Rochester, N.Y., assignor to Hydroacoustics Inc., Rochester, N.Y.

Filed Mar. 10, 1975, Ser. No. 557,140
Int. Cl.² G01V *1/04*, *1/38*; H04B *13/02*
U.S. Cl. 181—120 20 Claims

1. An acoustic transmitter comprising

a. means for radiating acoustic energy when vibrated,

b. driving means coupled to said means element to excite said radiating means into vibration.

c. means for providing an acoustic inertance, and

d. means for coupling hydraulically said inertance means to said radiating means for changing the natural resonant frequency of said radiating means whereby to reduce

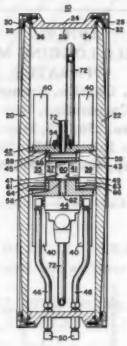
power required from said driving means to drive said radiating means over a given band of frequencies.

11. An acoustic transmitter which comprises:

a. a housing

b. radiating elements having a natural resonant frequency mounted in said housing,

c. hydraulic means coupled to said elements to drive said elements into oscillation,



d. means for supplying pressurized fluid to the hydraulic means, and

e. acoustic inertance means disposed within the path of oscillatory displacement of said elements for loading hydraulically said elements to achieve a desired resonant frequency.

3,978,941

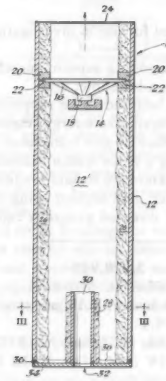
SPEAKER ENCLOSURE

Curt August Siebert, 4711 NW. 24th Court, Apt. 108, Lauderdale Lakes, Fla. 33313

Filed June 6, 1975, Ser. No. 584,617

Int. Cl.² H05K *5/00*

U.S. Cl. 181—151 **5 Claims**



1. An improved speaker enclosure comprising:

a tubular shaped enclosure body, insulating means disposed within said enclosure, conventional speaker coupled across and adjacent one end of said enclosure body;

a flexible diaphragm said diaphragm being flexibly, dynamically responsive to acoustical wave energy of a predetermined frequency and being disposed opposite said speaker enclosing said outer tubular body at one end, said diaphragm having an aperture disposed therethrough; and

an elongated venting tube connected across said diaphragm aperture and disposed axially in the direction of said speaker within said enclosure chamber.

3,978,942

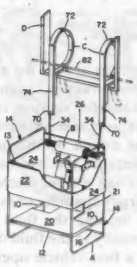
PORTABLE WINDOW-ATTACHED EMERGENCY DESCENT MECHANISM

Ramon Jimenez, 1248 Silver Ave., San Francisco, Calif. 94134

Filed Apr. 17, 1975, Ser. No. 568,975

Int. Cl.² A62B *1/08*

U.S. Cl. 182—75 **5 Claims**



1. A portable descent mechanism for descending from a window, having sides defining a first width, to a ground level in emergency situations comprising:

at least a pair of attachment hooks for attachment to said window, said attachment hooks having affixed thereto a horizontal crossbar with ends separated by a length greater than the width of the window, said crossbar disposed upon said hooks such that when said hooks are attached to the window said crossbar remains interior of the window with said crossbar ends extending beyond the sides of the window;

a pair of cables connected to said hooks;

means for carrying a passenger during descent from the window to the ground level;

a pair of spools mounted upon said passenger means and having said cables connected thereto and wound thereon, said spools adapted to play out said cables during descent of said passenger means;

braking means connected to said spools and having a first brake control for initiating and permitting descent at a pre-selected rate and a second brake control that overrides said first brake control to decrease the rate of descent from the pre-selected rate;

a first gear fixedly attached to one of said spools;

a second gear disposed to engage said first gear;

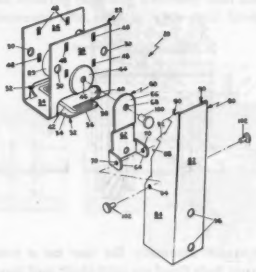
means to selectively engage at least one of said gears such that when so engaged rotation of said spool in a direction permitting descent is prohibited; and

a crank handle connected to said second gear for rotation of said second gear such that turning said crank in one direction allows said passenger means to ascend from the ground level.

3,978,943
FOLDING SUPPORT BRACKET

James R. Greenman, 5185 Silver Pines Road, and Philip J. Pelky, 9600 Peninsular Drive, both of Traverse City, Mich. 49684

Filed July 7, 1975, Ser. No. 593,645
Int. Cl.² F16M *11/00*
U.S. Cl. 182—155 **21 Claims**



1. Apparatus for supporting a pair of legs on a beam to form a collapsible sawhorse, barricade, or the like comprising:

a beam support bracket for engaging and supporting a beam, said beam support bracket including a base having a pair of spaced, side flanges extending generally in the same direction from said base;

a pair of leg brackets, each of said leg brackets adapted to engage and support a leg member; and

a pair of swivel brackets each including first securing means for pivotally securing said swivel bracket to one of said side flanges and second securing means for pivotally securing one of said leg brackets to said swivel bracket; said first securing means allowing each of said swivel and leg bracket combinations to be pivoted as a unit between a folded position in which they are generally transverse to said beam support bracket and extend along the sides of said beam support bracket wherein any leg members in said leg brackets are generally parallel to a beam when such a beam is secured in said beam support bracket and an upright position in which said leg brackets extend generally transverse to a beam when such a beam is secured in said beam support bracket; said second securing means allowing said leg brackets to be pivoted into a final position in which they are braced against said side flanges; and

stop means on said beam support bracket for limiting pivotal movement of each of said swivel brackets about said first securing means to position said swivel and leg bracket units in said upright position, said stop means including restraining means spaced apart from said first securing means for preventing movement of said swivel brackets outwardly away from said beam support brackets when said swivel and leg bracket units are in said upright position.

3,978,944
LADDER

Ronald P. Hickman, Waltham Abbey; Brian Anthony Luff, Norwich; Edgar Ronald Rossell, Waltham Abbey, and Derek John Charles Bernard, Benged, all of England, assignors to Inventec International Limited, Point Robert Sark, Guernsey (Channel Is.)

Filed Mar. 13, 1975, Ser. No. 558,121
Int. Cl.² E06C *1/20, 1/383*
U.S. Cl. 182—162 **57 Claims**

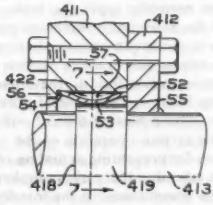
1. A foldable ladder comprising, in combination: a central elongate member and two outer elongate members arranged one on each side of, and substantially in parallel to, the central member; a series of rungs each foldably connected to the central member and one of the outer members, each rung being arranged to fold between an erected position, in which it extends generally at right angles to the longitudinal direction of said member to which it is connected, and a storage position in which the rung lies substantially parallel to the central member with the outer member to which it is connected extending parallel to and in close juxtaposition with the central member; engaging means, disposed on said central member adjacent its upper end, for holding cooperating engaging

means of a supporting member so that the upper end of said central member may be spaced from a supporting surface by said supporting member when the central member is in a substantially uptight, working configuration; and at least one strut means arranged on each side of, and extending outwardly from, said central member to the outboard region of one of said rungs for supporting said rungs and said outer members when in the erected position, the load on at least one rung being transmitted, via the outer member to which it is connected and one of said strut means, to said central member.

3,978,945
BRAKE DISC MOUNTING

Richard H. Gardner, Pleasant Hill, and Robert D. Kelley, Troy, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Sept. 17, 1974, Ser. No. 506,714
Int. Cl.² F16D *65/12*
U.S. Cl. 188—218 XL **2 Claims**



2. A mounting for a brake disc on a shaft having an annular pilot rib for registering said disc comprising a spacer member interposed between said pilot rib and said disc, said spacer member being a resiliently deformable sleeve member with greater resilience than said disc and having a width measured in the axial direction of said shaft at least as great as the thickness measured in the radial direction of said shaft, said sleeve member having central portions with a different diameter than adjacent side portions, said disc having an inner peripheral surface spaced from said pilot rib, said central

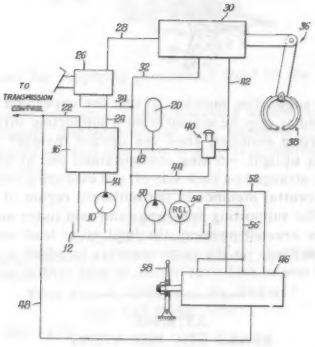
portions being first engaging surfaces and said side portions being second engaging surfaces of said sleeve member and at least one of said engaging surfaces being in engagement with said pilot rib and the other of said engaging surfaces being in engagement with said inner peripheral surface of said disc, and said sleeve member being disposed in a position between said pilot rib and said inner peripheral surface to provide an opening located radially of said pilot rib for radial movement of a portion of said sleeve member upon shrinkage of said brake disc on said pilot rib without binding of said disc on said pilot rib.

3,978,946

PARKING BRAKE SYSTEM WITH TRANSMISSION INTERLOCK

Michael D. Ream, Lafayette, Calif., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 19, 1974, Ser. No. 507,265
Int. Cl.² B60K *29/02*
U.S. Cl. 192—4 A **3 Claims**



1. In a vehicle the combination of an engine driven hydraulic pump, a hydraulic sump, a transmission control operable by means of fluid supplied by said pump, a brake including a brake actuator which has a double acting piston which is spring biased to normally apply the brake, a parking brake release control for selectively communicating fluid pressure from the pump to the brake actuator to overcome the spring bias thereof to release the brake, a service brake control for selectively communicating fluid to the brake actuator to balance the parking brake release control pressure in the actuator whereby the spring biasing thereof will selectively apply the brake during service operation of the vehicle, and interlock valve means for preventing actuation of the transmission control without releasing the parking brake.

conduit means communicating the interlock valve with the transmission control, the parking brake release control, and to the sump,

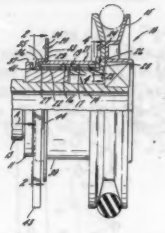
said interlock valve including spring biased spool means for venting the transmission control to sump while the parking brake control is selected to cut off parking brake release pressure to the brake actuator, and further including means responsive to parking brake release pressure in the brake actuator, to shift the spool means and interrupt communication of the transmission control with the sump, and allow pressure to build up in the transmission control for operation thereof.

3,978,947

CLUTCH BRAKE UNIT

Charles W. Modersohn, Beloit, Wis., assignor to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Filed Aug. 26, 1974, Ser. No. 500,343
Int. Cl.² F16D *67/02*
U.S. Cl. 192—12 BA **12 Claims**



1. A clutch-brake assembly for use on a rotatable shaft including an input hub fixed on said shaft and having a generally cylindrical driving surface, an output hub journaled on said shaft adjacent said input hub and having a generally cylindrical driven surface, a generally cylindrical sleeve having one end fixed to said output hub and a free end portion telescoped over said driving and driven surfaces with the interior surface of said sleeve spaced radially outward from said two surfaces, a helical spring telescoped into the space between said sleeve and said hubs and normally being wound into torque-transmitting engagement with said driving and driven surfaces so said two hubs rotate bodily with said shaft, means holding the output end of said spring against substantial rotational and axial movement with respect to said output hub, an annular shoulder formed on said input hub and extending radially outward from said driving surface, said shoulder being spaced axially from the free end of said sleeve, and a generally circular brake disk loosely telescoped onto the free end portion of said sleeve and including an annular flange extending radially inward between the free end of said sleeve and said shoulder and beyond the interior surface of said sleeve so said disk is captivated against substantial radial and axial movement relative to said shaft, said disk normally being in engagement with the input end portion of said spring so as to rotate with said shaft and being rotatable relative to said sleeve whereby application of a braking torque to said disk retards the rotation thereof thereby unwinding said spring from engagement with said driving and driven surfaces and toward engagement with the interior surface of said sleeve so as to form a torque-transmitting connection between said disk and said output hub to retard rotation of the latter.

3,978,948

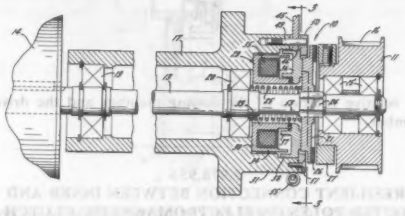
NEUTRAL-TYPE ELECTROMAGNETIC CLUTCH-BRAKE UNIT

John S. Baer, Bar Harbor, Maine, assignor to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Filed Apr. 28, 1975, Ser. No. 572,195
Int. Cl.² F16D *67/06*
U.S. Cl. 192—18 B **3 Claims**

1. A clutch-brake unit operable selectively to either (a) couple a rotatable driving element to a rotatable driven element, (b) uncouple the elements and brake one of the elements, or (c) uncouple the elements and allow free-wheeling of said one element, said unit comprising a rotatably fixed support, a brake member mounted for rotation relative to said support, means on said support and selectively engageable with said brake member in every angular position of the brake member and operable when so engaged to frictionally hold said brake member against rotation relative to said support regardless of the angular position of the brake member, an

armature rotatable with said one element and movable between clutching and braking positions, said armature being disposed out of braking engagement with said brake member and being disposed in clutching engagement with the other of said elements when said armature is in said clutching position whereby said armature couples said elements for rotation in unison, said armature being disposed out of clutching engagement with the other of said elements and being disposed in braking engagement with said brake member when said armature is in said braking position whereby said armature uncouples said elements and coacts with said brake member to brake said one element so long as said brake member is held against rotation relative to said support, selectively operable electromagnetic means on said support for causing said armature to move between said clutching and braking positions, and said holding means being selectively operable, when said armature is braking engagement with said brake member, to release said brake member from said support and permit said brake member and said armature to rotate in unison relative to said support thereby to enable said one element to freewheel when said armature is in engagement with said brake member and said brake member is released.



3,978,949
FRICTIONAL OVERRUNNING CLUTCH

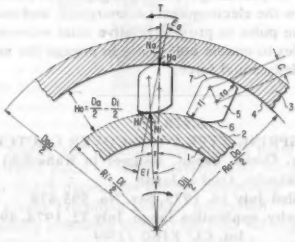
Karlheinz Timtner, Bad Homburg vor der Hohe, Germany, assignor to Ringspann Albrecht Maurer K.G., Bad Homburg vor der Hobe, Germany

Filed Aug. 1, 1975, Ser. No. 601,314

Claims priority, application Germany, Aug. 19, 1974, 2439632

Int. Cl.² F16D *41/07*

U.S. Cl. 192—41 A **11 Claims**



1. In a radially wedging, frictional overrunning clutch having an inner ring and an outer ring arranged concentrically with the inner ring; the inner ring having an outer cylindrical surface constituting an inner track; the outer ring having an inner cylindrical surface constituting an outer track; Z sprags of profiled cross section disposed between the inner and the outer tracks in a circumferential series; each sprag having an inner clutch face cooperating with the inner track and an outer clutch face cooperating with the outer track; each sprag being arranged such that upon rotation between the inner and the outer rings relative to one another in the direction of clutch engagement, the clutch faces of each sprag wedge against the respective track along a line of contact whereby torque is transmitted; the improvement wherein the radius of the inner track is determined by subtracting from the nominal radius of the inner track the extent of compression of the inner ring, at the location of contact with the sprags, caused by a maximum transmissible torque and the radius of the outer track is determined by adding to the nominal radius of the outer track the extent of expansion of the outer ring, at the location of contact with the sprags, caused by the maximum transmissible torque.

3,978,950
FRICTIONAL OVERRUNNING CLUTCH

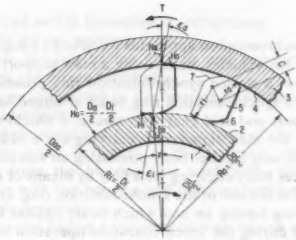
Karlheinz Timtner, Bad Homburg vor der Hohe, Germany, assignor to Ringspann Albrecht Maurer K.G., Bad Homburg vor der Hohe, Germany

Filed Aug. 19, 1975, Ser. No. 605,875

Claims priority, application Germany, Aug. 19, 1974, 2439682

Int. Cl.² F16D *41/07*

U.S. Cl. 192—41 A **9 Claims**



9. In a radially wedging, frictional overrunning clutch having an inner ring and an outer ring arranged concentrically with the inner ring; the inner ring having an outer cylindrical surface constituting an inner track; the outer ring having an inner cylindrical surface constituting an outer track; a plurality of sprags of a profiled cross section disposed between the inner and the outer tracks in a circumferential series; each sprag having an inner clutch face cooperating with the inner track and an outer clutch face cooperating with the outer track; each sprag being arranged such that upon rotation between the inner and the outer rings relative to one another in the direction of clutch engagement, the clutch faces of each sprag wedge against the respective track along a line of contact whereby torque is transmitted; the improvement wherein, while varying the ring thickness ratio of at least one of the two rings in the sense of a maximum of the quotient driving torque/angle of rotation, the radius of the inner track is determined by subtracting from the nominal radius of the inner track the extent of compression of the inner ring, at the location of contact with the sprags, caused by an assumed normal force and the radius of the outer track is determined by adding to the nominal radius of the outer track the extent of expansion of the outer ring, at the location of contact with the sprags, caused by an assumed normal force.

3,978,951

SYNCHRONIZATION APPARATUS FOR SPEED-CHANGING GEARING OR TRANSMISSIONS, ESPECIALLY FOR VEHICLES

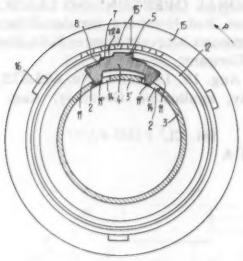
Jackie Andre De Ruyter, L'Escalade C2 no. 307, Saint Julien en Genevois, France (74160), and Jean-Claude Caveng, ch. du Mont-Blanc 8, 1224 Chene-Bougeries, Switzerland

Filed May 27, 1975, Ser. No. 580,588

Claims priority, application France, May 28, 1974, 74.19639; Jan. 13, 1975, 75.1852

Int. Cl.² F16D *23/06*

U.S. Cl. 192—53 C 9 Claims



1. A synchronization apparatus for speed-changing gearing, especially for vehicles, comprising a claw support and a gear shift sleeve, a slotted synchronization ring possessing a slot, said slotted synchronization ring being arranged between said claw support and said gear shift sleeve, a blocker body supported by the claw support for carrying out a radial outward movement, said blocker body possessing an entrainment cam, said blocker body engaging with play by means of the entrainment cam in the slot of the synchronization ring, said synchronization ring having an end which bears against the entrainment cam during the synchronization operation in the direction of the relative rotation which is to be equalized between the claw support and the gear shift sleeve, said blocker body and said synchronization ring possessing stops coacting with one another such that they can travel over one another, said stops being arranged after the entrainment cam in the direction of the relative rotation which is to be equalized and can be brought into engagement with one another by radially shifting the blocker body.

3,978,952

FLUID COUPLING

Jeffrey Hall, Huddersfield, England, assignor to Holset Engineering Company Limited, England

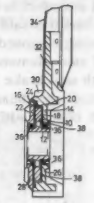
Filed Oct. 30, 1974, Ser. No. 519,108

Claims priority, application United Kingdom, Nov. 15, 1973, 53014/73

Int. Cl.² F16D *31/00*

U.S. Cl. 192—58 B 9 Claims

1. A viscous shear coupling comprising an annular driving member, a driven member having an internal annular chamber receiving said annular driving member, said driven member being axially and radially located for rotation relative to said driving member, facial planar and circumferential surfaces of said chamber and opposing facial planar and circumferential surfaces of said driving member at least in part being in close-spaced relationship, viscous coupling fluid in said chamber, and a 0.0005 to 0.0015 inch thick layer of non-metallic anti-friction material on at least those parts of said facial planar and circumferential surfaces of said annular chamber which are in close spaced relationship, said non-metallic anti-friction material forming journal and thrust bearing means for the relative rotation of the driving member and the driven member.



3,978,953

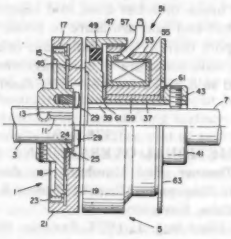
RESILIENT CONNECTION BETWEEN INNER AND OUTER POLES ON ELECTROMAGNETIC CLUTCH

Donald Leroy Miller, Horseheads, N.Y., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Filed June 24, 1975, Ser. No. 589,816

Int. Cl.² F16D *27/10*

U.S. Cl. 192—84 C 6 Claims



1. An electromagnet clutch having a driving clutch member and a driven clutch member, an armature on one of the members, an electromagnet having a pair of poles on the other of the members for providing a driving engagement between the members when the electromagnet is energized, and means for connecting the poles to provide relative axial movement between the poles to enable both poles to engage the armature with substantially equal force.

3,978,954

COIL SPRING TYPE OVER-COVER CLUTCH

Minoru Akita, Osaka, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed July 14, 1975, Ser. No. 595,878

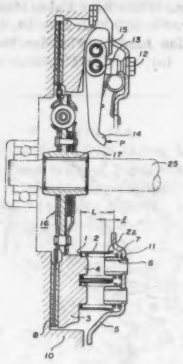
Claims priority, application Japan, July 22, 1974, 49-87418

Int. Cl.² F16D *13/44*

U.S. Cl. 192—89 R 2 Claims

1. A deformation and slipping-off prevention means of spring incorporated in a coil spring type over-cover clutch comprising a cylindrical spring cap two having an inward flange one at one end thereof, said flange one being fitted around in a projection four of a pressure plate three, a coil spring seven coaxial with said projection four and a spring support six fixed to a clutch cover five being assembled between the flange one and the clutch cover five, and the lengths of said spring support six and spring cap two being such that the spring cap two does not interfere with the clutch cover five

even in the maximum released condition of the clutch and that the spring support six is securely inserted within the spring cap



two even under the maximum worn out state of a clutch facing eight.

3,978,955

AXIALLY AND RADIALLY RIGID SUPPORT PLATE FOR DIAPHRAGM CLUTCH

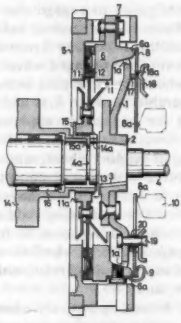
Tamio Nagano, 901, Horimizo, Neyagawa, Osaka, Japan

Continuation-in-part of Ser. No. 331,608, Feb. 12, 1973, abandoned. This application Nov. 8, 1974, Ser. No. 522,302

Claims priority, application Japan, Feb. 22, 1973, 47-22042[U]

Int. Cl.[2] F16D *13/71*

U.S. Cl. 192—89 B **4 Claims**



3. An axially and radially rigid support plate formed of a single integral piece of sheet material and for pivotally supporting a clutch diaphragm spring, comprising:

A. an axially extending annular projection;

B. a radially extending annular flat base, having a circumferential inner edge and a circumferential outer edge, which is rigidly attached to and is disposed on either side of said projecton, so that said projection extends in one axial direction from said base;

C. an axially extending inner annular lip which is rigidly attached to said inner edge and extends oppositely to said one axial direction; and

D. an axially extending outer annular flange which is rigidly attached to said outer edge and extends oppositely to said one axial direction, said inner lip and said outer flange being radially spaced apart by said flat base, whereby the radially measured width of said support plate, from said inner lip to said outer flange, prevents radial expansion of said support plate and the axial extensions of said inner lip and of said outer flange combine to inhibit axial bending of said support plate.

3,978,956

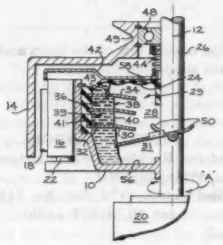
DELAYED-ACTION CENTRIFUGAL CLUTCH TRANSMISSION

John Bochan, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Aug. 26, 1974, Ser. No. 500,390

Int. Cl.[2] F16D *43/06, 25/00, 13/60*

U.S. Cl. 192—105 A **10 Claims**



1. A delayed-action transmission, comprising:

a rotatable driven member;

a rotatable housing having an axis and being positioned adjacent the driven member;

a diaphragm connected to the housing and defining therewith a reservoir;

a baffle plate extending through a portion of the reservoir from the outer periphery of the reservoir toward and spaced from the housing axis, said baffle plate being movable with the housing and defining upper and lower reservoir portions;

a fluid diverter having a volume chamber having an inlet in fluid communication with the lower reservoir portion and an outlet in fluid communication with the upper reservoir portion; and

actuation means associated with the driven member and the diaphragm for movement by the diaphragm in response to rotation of the housing, said actuating means being movable between a first position at which the driven member is disengaged from the housing and a second position at which the driven member is engaged with and rotatable in response to rotation of the housing.

3,978,957

HOLLOW GUIDING MAST FOR A CHARGING DEVICE OF A CORE REACTOR

Bernhard Hoffmeister, Wilhelmshaven, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Germany

Filed Oct. 10, 1974, Ser. No. 513,765

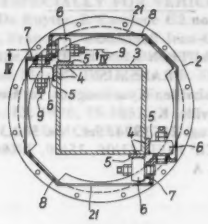
Claims priority, application Germany, Nov. 13, 1973, 2356503

Int. Cl.[2] G21C *19/20;* **B65G** *11/16*

U.S. Cl. 193—1 **3 Claims**

1. For a charging device of a core reactor apparatus for guiding a gripper body internally of a horizontal hollow mast consisting of sections placed against each other, each section consisting of a plate forming a mantle which is subdivided into two halves and only two horizontal spars inserted between these halves, each spar having two legs which converge toward the inside of the mast and guide means supported thereby inside the mast, the halves of the plate mantle being welded to the spars toward the inside of the mast. the gripper body

having only two diagonally oppositely located pairs of horizontal guide surfaces, the guide surfaces of each pair converging in a direction toward one of the spars and engaging against the guide means supported thereby.

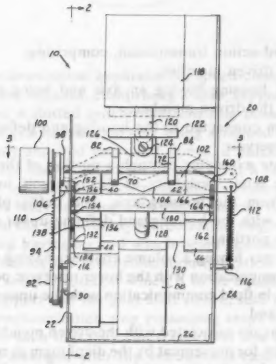


3,978,958

TICKET VENDOR

Lawrence Zandstra, Rockford, Mich., assignor to Rowe International Inc., Whippany, N.J.

Filed Oct. 3, 1974, Ser. No. 511,594
Int. Cl.² G07F *11/00*
U.S. Cl. 194—2 **14 Claims**



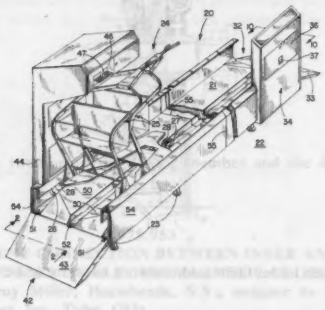
1. Apparatus for dispensing individual tickets from a supply of connected tickets to a delivery opening in response to a credit signal including in combination a cabinet, means forming a delivery opening in said cabinet through which individual tickets are to be delivered to customers, a supply location in said cabinet for receiving a supply of tickets, means forming a path for movement of tickets from said supply to said delivery opening, said path including an escrow location between said supply location and said delivery opening at which escrow location a severed ticket held thereat is inaccessible from outside said cabinet, means at said escrow location for holding a severed ticket, means responsive to said credit signal for advancing said severed ticket from said escrow location to said delivery opening, means responsive to movement of said severed ticket out of said escrow location for moving a ticket from said supply toward said escrow position, and means responsive to movement of said ticket from said supply into said escrow location for severing said ticket from said supply, said means responsive to movement of said ticket from said supply location into said escrow location comprises means for sensing the presence of a ticket in said escrow location and means for adjusting the position of said sensing means along the path of movement of a ticket from said supply to said delivery opening.

3,978,959

DISPENSING SYSTEM FOR WHEELED VEHICLES

James M. Muellner, White Bear Lake, Minn., assignor to Smarte Carte, Inc., White Bear Lake, Minn.

Continuation of Ser. No. 380,822, July 19, 1973, abandoned. This application June 7, 1974, Ser. No. 477,492
Int. Cl.² G07F *7/00*
U.S. Cl. 194—4 R **10 Claims**



1. An improved dispenser apparatus for use in combination with a vehicle vending system of the type characterized by retaining means for retaining a plurality of vehicles each having a chassis carried by a plurality of normally floor-engaging support wheels a dispensing terminal from which the vehicles are dispensed, and monetary actuated control means for normally producing a first vend signal and for producing a second vend signal different from the first vend signal upon receipt thereby of a predetermined monetary amount, said dispenser apparatus comprising:

a. wheel control means operatively connected at the dispensing terminal configured to engage one of the floor-engaging support wheels of that retained vehicle disposed immediately adjacent the dispensing terminal for directly controlling movement of the engaged wheel in a dispensing direction, said wheel control means including a wheel release member operable between first and second positions and mounted for engagingly applying movement controlling forces directly to the circumferential tread portion of the engaged support wheel, said wheel release member being operable in its first position to engage the support wheel so as to directly block movement thereof in said dispensing direction and being yieldingly movable to its said second position in response to forces exerted thereon by the engaged support wheel to enable movement of the engaged support wheel relative thereto in said dispensing direction; and

b. dispenser actuator means operatively connected to receive firsts and second vend signals for activating in response thereto said wheel control means to selectively block and enable dispensing movement of the engaged support wheel, comprising:

i. pawl and ratchet latching means cooperatively engaging said wheel release member for controlling movement thereof between its said first and said second positions, said pawl and ratchet latching means being operable in a latched mode to engagable lock said wheel release member in its said first position, preventing movement thereof toward its said second position, and being operable in an unlatched mode to release locking engagement of said wheel release member, enabling movement thereof between its said first and said second positions; and

ii. a plurality of actuator members connected to receive the vend signals and being cooperatively responsive thereto for selectively controlling the operative mode of said pawl and ratchet latching means, said actuator

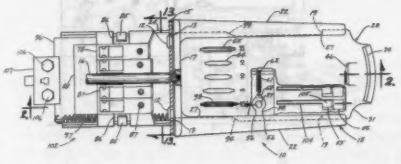
members being cooperatively engageable upon receipt of a first vend signal to actuate said pawl and ratchet latching means for operative engagement in its said latched mode, and being cooperatively engagable upon receipt of a second vend signal to activate said pawl and ratchet latching means for operative engagement in its said unlatched mode.

3,978,960

COIN AUTHENTICATING SLIDE MECHANISM

John C. Mellinger, and William J. McNally, both of Newton, Iowa, assignors to The Maytag Company, Newton, Iowa

Filed Nov. 19, 1975, Ser. No. 633,447
Int. Cl.² G07F 3/02
U.S. Cl. 194—55 23 Claims



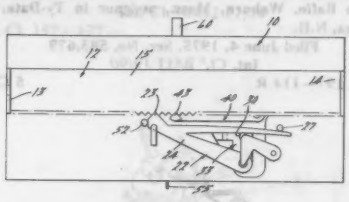
1. A coin slide apparatus for initating the operation of a machine with a predetermined combination of coins supported substantially vertically on edge, comprising: slide support means for mounting said coin slide apparatus to said machine and including a generally vertical faceplate having at least one vertical passageway for passing coins on edge and further including a forwardly and rearwardly extending slide housing defining a coin slide guideway; a coin slide assembly supported on said slide housing and reciprocally movable in said guideway from a coin receiving position and through intermediate coin measuring and coin ejecting positions to an operative position for activating said machine, said slide assembly including a plurality of slots of predetermined size for receiving and supporting said coins for movement with said slide assembly, said slide housing including a guideway surface for supporting said coins in said slots at a first elevation relative to said coin slide assembly in said coin receiving position and further including a downwardly sloping ramp in said guideway surface permitting said coins to drop from said first elevation to a lower second elevation as said slide assembly is moved from said coin receiving position to said coin measuring position; stop means for preventing movement of said slide assembly to said operative position in the absence of said predetermined combination of coins and including a plurality of latch arms pivotally mounted on said slide housing, each of said arms having a pawl engageable with said slide assembly in a first posture of said arms to prevent movement of said slide assembly beyond said coin measuring position; coin authenticating means comprising a cam on each of said latch arms and an abutment on said slide housing spaced above the cam of each latch arm and cooperable with said cam for engaging with opposite edges of said coins, each of said latch arm being responsive to a coin of a predetermined diameter operating on said cam at said lower elevation for pivoting to a second posture for nonengagement with said slide assembly, said slide assembly being movable beyond said coin measuring position toward said operating position only when all of said plurality of latch arms are pivoted to said second postures; and coin ejection means including at least one open port in said slide housing through which coins are ejected.

3,978,961

TYPEWRITER CARRIAGE ACTUATING MECHANISM

James E. Thomson, Pleasant Lake, Mich., assignor to Western Stamping Corporation, Jackson, Mich.

Filed Apr. 21, 1975, Ser. No. 570,167
Int. Cl.² B41J 19/26
U.S. Cl. 197—89 8 Claims



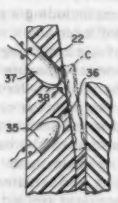
7. A carriage actuating mechanism for a typewriter which includes a frame, a carriage movable in a linear path on the frame and a ratchet-toothed part having a linear series of teeth and movable with and parallel to the path of movement of the carriage, including an actuator having a portion supported on the frame for movement in a path generally parallel to the path of the carriage beside but spaced laterally from said ratchet teeth, a pusher pawl pivotally connected to said portion of the actuator for movement along the path of the carriage and for swinging movement toward and from interengaged relation with the ratchet teeth about its axis of pivotal connection to said portion of the actuator, said pawl being movable longitudinally with the carriage to actuate the same in response to movement of the actuator, characterized by a detent pawl for yieldably opposing movement of the carriage, both of said pawls and the ratchet teeth having inclined surfaces whereby the pawls can be cammed out of engagement by force applied directly to the carriage to move the same in either direction.

3,978,962

SOLID STATE, COIN ACTIVATED MECHANISM

Lester Gregory, Jr., St. Petersburg, Fla., assignor to International Acceptor Corporation of Florida, St. Petersburg, Fla.

Filed Apr. 21, 1975, Ser. No. 569,992
Int. Cl.² G07F 3/02
U.S. Cl. 194—97 A 24 Claims



1. Coin rejector means, comprising: a downwardly inclined coin feed chute; means constraining a coin to move along said chute; light emitting means at one side of the chute directed across the path of travel of a coin moving along the chute; signal-producing light sensitive means at said one side of the chute adjacent the light emitting means and aimed to receive light reflected from a bona fide coin of predetermined reflectivity moving past the light emitting means and to produce a signal; said chute having means operatively associated with the light emitting means and the light sensitive means to preclude signal-producing reflection of light to the light sensitive means from an improper coin and the like which has less than the predetermined reflectivity; and gate means operative in response to a signal from the light sensitive means to pass a

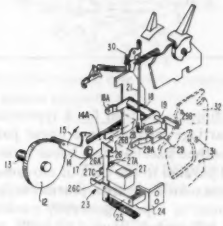
bona fide coin of selected value and to reject a slug or coin and the like of improper value.

3,978,963

FORWARD AND REVERSE INDEXING MECHANISM FOR AUTOMATIC TYPEWRITER

Mariano Baffo, Woburn, Mass., assignor to Ty-Data, Inc., Nashua, N.H.

Filed June 4, 1975, Ser. No. 583,679
Int. Cl.² B41J *19/90*
U.S. Cl. 197—114 R **5 Claims**



1. A combined forward and reverse indexing mechanism for an automatic typewriter including a rotatable platen, a rotatable power shaft, a cam mounted on said shaft for rotation therewith and a cam follower operatively engaging said cam and movable in response to rotation thereof, said mechanism comprising:

A. a forward indexing ratchet attached to the platen;

B. forward indexing means for incrementing said forward indexing ratchet and rotating the platen in a first direction;

C. a reverse indexing ratchet attached to the platen;

D. reverse indexing means for incrementing said reverse indexing ratchet and rotating the platen in a second direction opposite to said first direction,

E. means for selectively coupling motion of the cam follower to said forward and reverse indexing means, respectively, said coupling means comprising

i. an actuator lever engaging the cam follower for movement therewith,

ii. an actuator arm including a portion which is pivotally attached to said lever and a free end,

iii. the free end of said arm being pivotal between first and second positions and having ridge means thereon so that in the first position the ridge means couples the motion of the cam follower only to said forward indexing means and in the second position the ridge means couples the motion of the cam follower only to said reverse indexing means, and

F. means for engaging said actuator arm and for pivoting the free end of said actuator arm between the first and second positions.

3,978,964

MAGNETIC HEAD CONTROL ASSEMBLY FOR A MAGNETIC PASSBOOK PRINTING SYSTEM

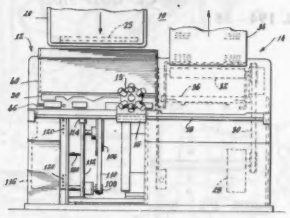
Okun Kwan, Trumbull, Conn., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed July 31, 1974, Ser. No. 493,398
Int. Cl.² B41J *13/12, 19/92*
U.S. Cl. 197—127 R **8 Claims**

1. A printing apparatus having a printer for printing on a document containing a stripe on which indicia with respect to the printing operation to be performed may be written and/or read therefrom by a scanner assembly, which indicia is used in the printing operation, comprising

a. a document printing station for receiving a document which is to be printed upon having a stripe thereon on which indicia may be recorded and/or read pertaining to the print operation which is to be performed on said document,

b. said document printing station having a scanner assembly carrying a transducer head adapted to scan the stripe of said document positioned when received in said document printing station and a document positioning means having a home position for positioning said document for scanning by said scanner assembly and a plurality of other positions corresponding to the positioning of said document by said document positioning means for the printing of one or more lines thereon,



c. a document guide means mounted on said document printing station for guiding said document into said document positioning means,

d. a transducer head aperture located in said document guide means for providing a travel path for said transducer head to scan said stripe, and

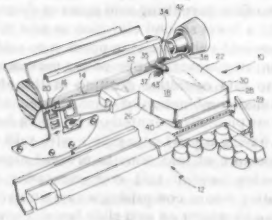
e. a plurality of pivotal fingers pivotally suspended on the front of said transducer head aperture which are pivoted out of the way of the transducer head as said transducer head moves in said aperture and which functions to prevent said document from catching in said aperture or otherwise interfering with the proper insertion of said document into said document positioning means.

3,978,965

RIBBON CARTRIDGE FOR AUTOMATIC TYPEWRITER FUNCTION

Stanley J. Klem, Cortland, N.Y., assignor to SCM Corporation, New York, N.Y.

Filed June 23, 1975, Ser. No. 589,646
Int. Cl.² B41J *33/02, 19/62*
U.S. Cl. 197—151 **12 Claims**



1. A cartridge for a typewriter, which typewriter includes means for receiving the cartridge and actuable means to perform a typewriter function for causing the alignment of a selected platen impact point relative to the typewriter print point, the cartridge comprising:

an abutment carried on the cartridge having means yieldable relative to the cartridge upon cartridge insertion and rigid relative to the cartridge upon cartridge removal for

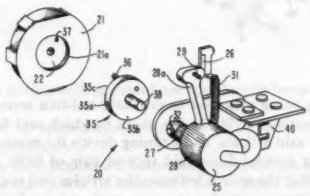
actuating the typewriter actuable means to thereby perform the typewriter function.

3,978,966

TABULATION OPERATION SENSING UNIT FOR AUTOMATIC TYPEWRITER

Mariano Baffo, Woburn, Mass., assignor to Ty-Data, Inc., Nashua

Filed June 4, 1975, Ser. No. 583,668
Int. Cl.² B41J *21/00*
U.S. Cl. 197—176 **1 Claim**



1. A tabulation sensing mechanism for use in an automatic typewriter of the type including tabulating means with a mainspring which unwinds during a tabulation operation, said mainspring including an outer housing, a central hub exposed through the outer housing which rotates when the mainspring unwinds and which includes an eccentrically located hole therein, said tabulation sensing mechanism comprising:

A. a fluid clutch including

i. an outer housing containing a viscous fluid,

ii. a fluid clutch shaft rotatably mounted in said fluid clutch housing and protruding therefrom, the end of said shaft protruding from said fluid clutch housing being hollow,

iii. set screw means positioned on the hollow end of said shaft and tightenable into said shaft,

iv. said fluid clutch housing being pivotal between first and second positions in response to rotation of said shaft;

B. switch means for generating an electrical signal in response to the pivotal movement of said fluid clutch housing from said first to said second position; and

C. an interconnecting member for coupling the rotary motion of the mainspring hub to said fluid clutch shaft including

i. a disk having first and second major surfaces,

ii. an eccentric pin integral with said disk and extending axially from said first major surface for engaging the eccentrically located hole in the hub of said mainspring and to be rotated when the mainspring unwinds, and

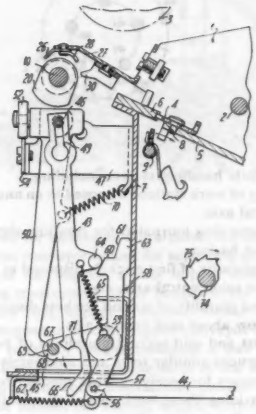
iii. a centrally located shaft integral with said disk and extending axially from said second major surface, said disk shaft being dimensioned to fit within the hollow end of said fluid clutch shaft and to be secured therein by said set screw means whereby said interconnecting member transfers the rotary motion of the mainspring to said fluid clutch shaft and the electrical signal generated by said switch means signifies that the typewriter is undergoing a tabulation operation.

3,978,967

TYPEWRITER TABULATOR

Gustave Gagnebin, Yverdon, Switzerland, assignor to Hermes Precisa International S.A., Yverdon, Switzerland

Filed Sept. 16, 1974, Ser. No. 506,583
Claims priority, application Switzerland, Sept. 17, 1973, 13285/73
Int. Cl.² B41J *21/14*
U.S. Cl. 197—177 **11 Claims**



1. A tabulator for typewriters having a carriage carrying a type head and movable along a platen, the tabulator comprising a rack having a series of tabulator blades that are individually movable between an inactive position and a set position, and the carriage comprising a carriage stop for cooperating with a blade in the set position, and wherein the improvement comprises a tabulator rod defining an axis, comprising the rack, and carrying the blades; means for mounting said tabulator rod free to pivot about said axis and to move therealong from a rest position; means for pivoting said tabulator rod under control of the typist to a plurality of distinct angular positions for tabulation, whereby the pivoting of said tabulator rod moves said blades into a plurality of different angular positions from a rest position; first and second areas comprised by each of said blades; first and second fixed stops comprised by said carriage and moving therewith and so located thereon, with respect to said first and second areas, that, when said carriage is stationary in a determined position for setting the tabulator, they face and cooperate with respective ones of said first and second areas of a blade for setting and subsequently clearing the latter during pivoting of said tabulator rod; and wherein said second areas are so located on said blades that a second area is placed in the path of the carriage stop when the blade thereof is rotated to the set position, so that when setting the tabulator said carriage stop of the moving carriage hits said second area of the set blade and causes said tabulator rod to move along said axis with said carriage; and selector means under control of the typist for limiting the axial movement of said tabulator rod and therefore of said carriage so that the latter is stopped for typing at the chosen tabulating position.

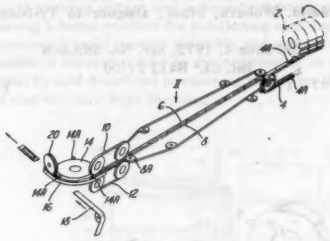
3,978,968
ARTICLE HANDLING SYSTEM

Richard S. Rose, Schenectady, N.Y., and Burton P. Clark, St. George, Vt., assignors to General Electric Company, Burlington, Vt.

Division of Ser. No. 377,396, July 9, 1973, Pat. No. 3,868,884. This application Oct. 24, 1974, Ser. No. 517,535

Int. Cl.² B65G 47/52

U.S. Cl. 198—339 **6 Claims**



1. An article handling system including:

a plurality of work stations disposed in an annular row about a central axis;

a distributor ring journaled for rotation about said central axis and having

a first plurality of first pockets disposed in an annular row about said central axis, and

a second plurality of second pockets disposed in an annular row about said central axis,

said first and said second pluralities of pockets being in congruent annular rows and alternately interspaced;

feeding means for receiving work pieces from a supply and for providing these work pieces to said first plurality of pockets in a train; and

transfer means journaled for rotation about said central axis and having

first means for transferring work pieces from said first plurality of pockets to said work stations, and

second means for transferring work pieces from said work stations to said second plurality of pockets,

said first means of said transfer means including a first sprocket journaled for rotation about its own axis and for traveling along a path concentric with said central axis, and

said second means of said transfer means including a second sprocket journaled for rotation about its own axis and for traveling along a path concentric with said central axis;

said feeding means including a feeder sprocket; and

said transfer means further including:

guide means journaled for oscillation between a first position wherein it guides a work piece from said feeder sprocket into said first sprocket, and a second position wherein it guides a work piece from said second sprocket into said feeder sprocket.

3,978,969
METHOD AND APPARATUS FOR THE MANUFACTURE OF FILTER-TIPPED CIGARETTES

Robert Ernest Williams, and Clifford Russell Marritt, both of London, England, assignors to Molins Limited, London, England

Filed July 16, 1974, Ser. No. 489,025

Claims priority, application United Kingdom, July 17, 1973, 33950/73

Int. Cl.² B65G 47/00

U.S. Cl. 198—461 **21 Claims**

1. Apparatus for feeding rod-like articles comprising means for supplying a stream of axially-moving rod-like articles, a first pair of cooperating belts for receiving said articles from said supply means and arranged such that in use said articles are gripped between the belts and accelerated thereby to space said articles apart in an endwise-moving stream, a second pair of cooperating belts arranged in line with said first pair of belts to convey said spaced-apart articles in an endwise-moving stream from said first pair of belts, said second pair of belts being arranged to grip said rod-like articles in a plane substantially at 90° to the plane in which said first pair of belts grip said articles, and a timing device for receiving the spaced-apart articles from said second pair of belts and arranged to enter the spaces between the articles and engage the ends of successive articles to carry said articles forward at regular intervals in an endwise-moving stream.

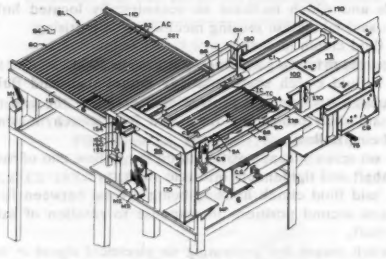
3,978,970
LOADER FOR CONTAINERIZED COOKER

James L. Reimers, Saratoga, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Apr. 25, 1974, Ser. No. 464,283

Int. Cl.² B65G 47/00

U.S. Cl. 198—425 **7 Claims**



1. Container handling apparatus for assembling a pattern for containers and transferring the assembled pattern into a receptacle, said apparatus comprising a conveyor having a container delivery section and a pattern forming section, a receptacle at one side of the conveyor pattern forming section, a pocketed pattern bar mounted at the delivery end of the pattern forming section for arresting containers on the conveyor, means for temporarily arresting a transverse row of containers on said conveyor delivery section to form a pattern of containers on the pattern forming section, a separator plate having peripheral downturned flanges for confining the pattern, means for depositing said separator plate on said pattern of containers, means for moving said pattern bar clear of the pattern of containers, and ejector means for engaging the separator plate and pushing the plate and the pattern of containers transversely off the pattern forming section of said conveyor and into said receptacle.

3,978,971

BULB ACCUMULATOR

Jonathan M. Conrow, Cleveland Heights; Myron Radzykewycz, and Darrell W. Markijohn, both of Lakewood, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed June 6, 1975, Ser. No. 584,390
Int. Cl.² B65G 47/29
U.S. Cl. 198—462 8 Claims

1. An in-line bulb accumulator for electric lamp bulbs comprising:

a pair of spaced-apart conveyor belts for holding bulbs therebetween;

a drag strip positioned below and spaced from said belts so that the cullets of said bulbs are inclined away from the direction of travel and drag on said strip when moving, said bulbs stacking when accumulating wherein each bulb is substantially supported by the preceding bulb and said strip and each accumulated bulb has minimal contact with said belts; and

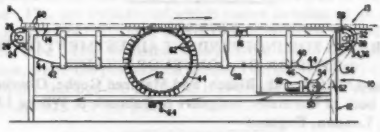
horizontal escapement means for selectively debouching bulbs from said accumulator causing less than all of the accumulated bulbs to contact said belts and move with said belts.

3,978,972

CAN INVERTING AND CLEANING APPARATUS

Frank E. Lyle, Duluth, Ga., assignor to American Home Products Corporation, New York, N.Y.

Filed Aug. 22, 1974, Ser. No. 499,708
Int. Cl.² B65G 17/46
U.S. Cl. 198—836 4 Claims



1. Apparatus for inverting open ended, ferromagnetic articles comprising:

A. a support structure;

B. a helical support member supported from said support structure;

C. a plurality of magnets coupled to the inside of said helical support member;

D. an endless belt;

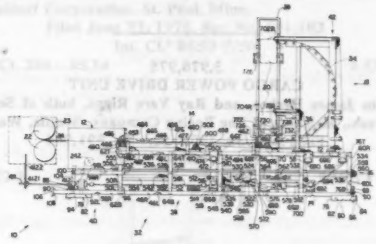
E. means to move said belt from one end of said support structure to the other while passing around the outside of said helical support member and maintaining the open ends of the ferromagnetic articles continuously facing away from said helical support member.

3,978,973

MACHINE FOR INVERTING AND STACKING FLAT ARTICLES

Allen H. Lloyd, Terrace Park; Edwin A. Molitor, Miami Township, Clermont County; Quentin E. Honnert, Cincinnati; Ronald H. Porter, Milford, and Norman P. Crowe, Miami Township, Clermont County, all of Ohio, assignors to Multifold-International, Inc., Milford, Ohio

Filed Dec. 12, 1974, Ser. No. 531,860
Int. Cl.² B65G 47/18; B65H 5/22
U.S. Cl. 198—401 7 Claims



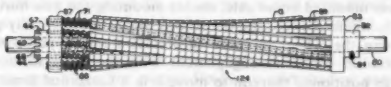
1. In a machine for delivering flat articles, the combination of a hopper, input conveyor means for supplying articles to an upper portion of the hopper, a first hopper conveyor belt means extending transversely of the hopper in the lower portion thereof, the first hopper conveyor means supporting articles in the hopper, a second hopper conveyor means, the second hopper conveyor means including a pair of spaced conveyor belts disposed on opposite sides of the first hopper conveyor means and directed substantially parallel to the first hopper conveyor means, the second hopper conveyor means having a pick-up station adjacent and underlying a side wall of the hopper, the second hopper conveyor means receiving articles from the hopper at the pick-up station, there being an unobstructed space between the belts of the second hopper conveyor means downstream of the first hopper means, and means for driving the first and second hopper conveyor means in a direction to advance articles from the hopper onto the second hopper conveyor means to be delivered thereby.

3,978,974

CONVEYING GLASS SHEETS OF DIFFERENT CURVATURES

Jack D. Morrissey, Tyrone, and Robert G. Frank, Murrysville, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 4, 1975, Ser. No. 546,854
Int. Cl.² B65G 13/02
U.S. Cl. 198—782 10 Claims



1. A conveyor roll for use in transporting glass sheets between spaced, opposed plenum chambers comprising a center driving shaft, a pair of axially spaced hubs mounted on said center shaft, a plurality of flexible peripheral shafts interconnecting peripheral portions of said hubs, each peripheral shaft having sufficient structural rigidity to support a moving glass sheet without appreciable distortion, means composed of a material harmless to glass mounted in glass contacting relation about the perimeter of said roll between said roll and said moving glass sheets engaged by said roll, means to fix a first one of said hubs to said center shaft in a given angular relation thereto, the second of said hubs being rotatably mounted on said center shaft in spaced relation to said fixed hub for receiv-

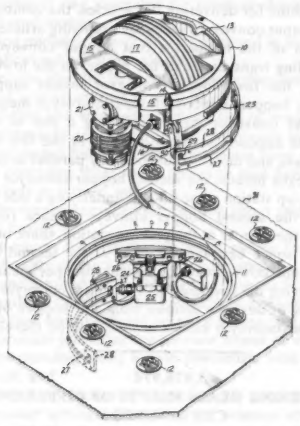
ing the end portions of said peripheral shafts opposite those received by said fixed hub, hub locking means positioned on said center shaft and comprising a hub locking member constructed and arranged to lock said second hub in any one of a series of discrete, preselected, readily obtained angularly disposed orientations relative to said first hub, and means to urge relative movement between said hub locking member and said second hub relative to the longitudinal axis of said center shaft to engage said second hub with said hub locking means in any selected one of said angularly disposed, discrete orientations, each of said orientations providing a discretely different configuration for the outer surface of said conveyor roll.

3,978,975

CARGO POWER DRIVE UNIT

Edwin James Herbes, and Ray Vere Riggs, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed June 30, 1975, Ser. No. 591,974
Int. Cl.² B65G *13/02*
U.S. Cl. 198—782 **4 Claims**



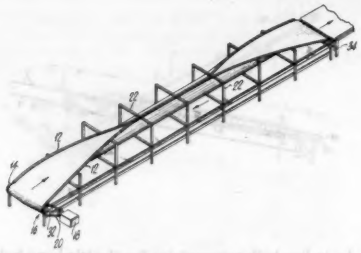
1. A power drive unit for cargo handling, comprising: a wheel mounted on an axle; means mounting the axle horizontally; means for rotating the wheel; means for vertically positioning the wheel to three positions: a raised position for maximum frictional engagement with the undersurface of cargo positioned thereon to move it in a horizontal direction, a lowered position for complete disengagement with the undersurface of cargo, and an intermediate position therebetween for partial frictional engagement with the undersurface of cargo positioned thereon during transition between predetermined directionally orientated cargo driving positions; said means for vertically positioning the wheel including mechanism for changing the directional orientation of the horizontal driving force of the wheel, while the wheel is substantially at said intermediate position; and said vertically positioning means, the wheel, and the directional orientation change mechanism, in combination, imparting a vertical raising and lowering motion to the wheel without changing the directional orientation of the wheel as it is moved between said raised position and said intermediate position.

3,978,976

CONVEYOR WITH METALLIC MESH BELT DISTORTION COMPENSATING MEANS

Ewald Albert Kamp, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 30, 1972, Ser. No. 239,628
Int. Cl.² B65G *15/08*
U.S. Cl. 198—617 **8 Claims**



1. A moving belt mechanism comprising:

a continuous belt which is substantially inelastic and is susceptible to only limited distortion and flexing,

drive means engaging said belt along lines parallel and proximate with or coincident with the edges of said belt,

belt edge guide means contacting said belt along lines parallel and proximate with or coincident with the edges of said belt to guide the edge areas of said belt along predetermined paths, and

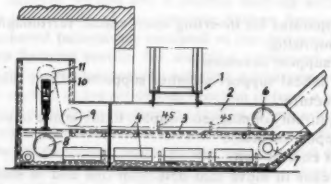
belt contouring means comprising at least one belt shaping device in a contoured shape of preselected design contacting the surface of said belt so as to change the cross-sectional profile of said moving belt in a pre-selected distortion-compensating sequence such that the distortions introduced into said belt by variations between the paths of the center of said belt and the edge areas of said belt are compensated for and thus removed, said contoured shape being a curve such that when said belt is passed across said device the surface of the belt is displaced from the place of the edges of said belt in a smooth curve, said belt shaping device comprising a plurality of adjacent pulleys freely rotating about a straight central axis, said pulleys varying in diameter to provide on their outer surfaces a smoothly curved surface.

3,978,977

APPARATUS FOR INDEPENDENT ADJUSTMENT OF THE TENSION OF CONVEYOR CHAINS

Bernhard Michelbrink, Bislich, and Manfred Goeke, Oberhausen, both of Germany, assignors to Babcock & Wilcox Limited, London, England

Filed Apr. 22, 1974, Ser. No. 462,727
Int. Cl.² B65G *15/30*
U.S. Cl. 198—816 **4 Claims**



1. A conveyor having two parallel flexible transversely connected members each having a tensioning device sepa-

rately adjustable to maintain a desired tension, means for continuously moving the members in unison, each tensioning device comprising a slideable member, a guide member in which the slideable member is free to move only in a predetermined linear path, an adjustable sprocket wheel rotatable about a separate axle disposed within the slideable member, and a linearly adjustable threaded spindle having one end set against the slideable member and providing over the full range of rotation of the spindle linear movement to the slideable member to adjust the tension of the flexible member.

3,978,978

APPARATUS FOR CONVEYING PARTICULATE MATERIALS

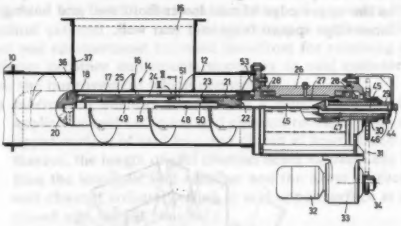
Martin Herter, Amdriesch 19, B-5021 Geyen, Germany

Continuation-in-part of Ser. No. 338,972, March 7, 1973, abandoned. This application June 9, 1975, Ser. No. 584,982

Claims priority, application Germany, Mar. 10, 1972, 2211549

Int. Cl.² B65G *33/00*; **F04D** *3/02*; **F04B** *15/02*

U.S. Cl. 198—601 **6 Claims**



1. Apparatus for conveying-away metal chips or other materials, which transmit an energy initiated into them onwards in the direction of introduction of the energy with minimal loss, comprising a channel which extends from at least one material supply station to a remotely located material delivery station, and drive means for moving said materials through the channel, characterized in that the channel is an inwardly smooth conveying pipe (**10**), and the drive means includes a tubular housing (**12**) and a worm (**14**) rotating in said tubular housing (**12**) and reciprocably driven in axial direction, said worm including a worm tube and an axial drive disposed in said worm tube, said axial drive having a piston (**21**) which can be stressed on both sides with pressurized medium and which is disposed in the axis of the worm and is connected to the worm tube (**17**), the cylinder of which piston consists of an axially fixed tube (**24**) provided with a rotational drive (**30–34**), said fixed tube being disposed between the worm tube and the piston, while the pressurized medium supply line (**48**) extends centrally through the piston so that pressure can be applied to one side (**23**) of the piston.

3,978,979

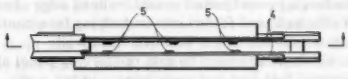
APPARATUS FOR ARRANGING, SEPARATING AND POSITIONING OF ITEMS BEING CONVEYED

Sandor Mezey, Budapest, Hungary, assignor to Egyesult Izzolampa ES Villamossagi RT, Budapest, Hungary

Filed Mar. 14, 1975, Ser. No. 558,502

Int. Cl.² B65G *47/14*

U.S. Cl. 198—394 **2 Claims**



1. An apparatus for the arranging, separating and positioning of individual items which have a bulbous portion and a neck portion, the apparatus comprising two mutually spaced parallel, movable endless conveying elements, and pairs of elements for regulating the positioning of the items arranged at the adjacent sides of the conveying elements, the spacing of the regulating elements in the direction at right angles to the length of the conveying elements is larger than the greatest width of the neck portion.

3,978,980

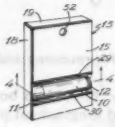
CARTON

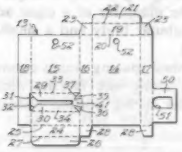
Harry I. Roccaforte, Western Springs, Ill., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

Filed June 27, 1975, Ser. No. 591,103

Int. Cl.² B65D *5/50*

U.S. Cl. 206—45.14 **1 Claim**





1. In a display carton for a cylinder or tube, said carton being rectangular in shape and having parallel front and back panels and two parallel side panels with a die cut section formed in said front panel, said section including two parallel shadow panels defined by hinge lines and extending the length of said die cut section and separated from each other, and means at one end of said die cut section adjacent a first side panel of said carton for engaging and restraining a first end of said tube, an improved die cut section in said front panel for supporting the end of said tube opposite said first end, said improved section comprising:

a center support member connected to a second side panel along a hinge line perpendicular to said shadow panels, said support member having die-cut sides and a fourth rounded edge opposite said hinge line, said member connected to said shadow panels by a nick at each end of said fourth rounded edge;

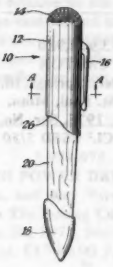
a triangular member positioned between each of the sides of said support member and said shadow panels, said triangular members connected to said second side panel along hinge lines extending between the ends of said hinge line connecting said support member and the point of intersection of the lateral edge of said front panel and said triangular members connected to said shadow panels to said front panel, said triangular members connected to said shadow panels by at least a nick near the ends of said fourth rounded edge.

3,978,981

LIGHTED CIGAR HOLDER

Francis S. Musick, 1169 A1A, Hillsboro Beach, Fla. 33062

Filed May 2, 1975, Ser. No. 573,815
Int. Cl.² A24F 15/00; B65D 85/10, 85/12
U.S. Cl. 206—276 3 Claims



1. A lighted cigar holder for retaining and carrying a lighted cigar comprising:
a tubular cigar receptacle body, said body diameter being sized to receive an end longitudinal portion of a lighted cigar, said body having a first end and a second end, said first and second ends being open;
a mesh screen disposed over and connected to said first end of said receptacle body;
a helically shaped cigar receiving spring which is thermally conductive, said spring being connected inside said tubular body, said spring having a larger diameter sized to encompass the diameter of a cigar adjacent the second end of said tubular body and a smaller diameter at the first end, and
a plurality of ribbed spacing means connected and disposed longitudinally along said interior receptacle body, said larger diameter spring portion conected to said ribbed means.

3,978,982

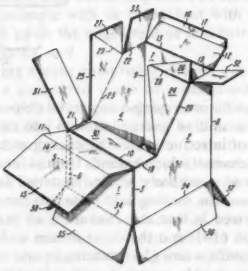
FORM-FITTING SHIPPING CONTAINER

Richard K. Duncan, Lithonia, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Dec. 9, 1974, Ser. No. 530,509
Int. Cl.² B65D 85/54
U.S. Cl. 206—326 9 Claims

1. A blank of substantially rectangular outline defined by spaced upper and lower longitudinal edges and spaced transverse side edges, adapted to be formed into a stepped container having a reinforced inclined upper front wall, comprising
a series of rectangular blank sections including a front wall section, two side wall sections, and a rear wall section, arranged in side-by-side relation;
said front wall section comprising, in the order named, a lower front wall panel extending upwardly from said lower edge of said blank, an intermediate horizontal wall panel and an upper front wall panel, foldably joined to each other along spaced first and second longitudinal fold lines, respectively;
said rear wall section comprising a rear wall panel extending upwardly from said lower edge of said blank and having a transverse dimension substantially greater than that of said lower front wall panel, and a top wall panel joined to said rear wall panel along an upper longitudinal fold line;
each of said side wall sections comprising a side wall panel having a stepped upper edge defined by
a short lower score line aligned with said first fold line and having a length corresponding to the spacing of said first and second fold lines;
a short upper score line aligned with said upper fold line and having a length corresponding to the transverse dimension of said top wall panel;
a diagonal score line interconnecting said lower and upper score lines;
each of said side wall sections including reinforcing flaps foldably joined to said lower and upper score lines, respectively, and defined by slots extending from the ends of said lower and upper score lines to said upper edge of said blank; and
a reinforcing panel and a stabilizing flap disposed between said reinforcing flaps, said reinforcing panel being foldably joined to said side wall panel along said diagonal score line and said stabilizing flap being foldably joined to said reinforcing panel along a fold line perpendicular to said diagonal score line.

4. A stepped shipping container formed from a single unitary blank, comprising
a. a lower front wall;
b. a rear wall spaced from said lower front wall and having a vertical extent substantially greater than that of said lower front wall;
c. an inwardly extending intermediate horizontal wall joined to the upper edge of said lower front wall and having an inner edge spaced from said rear wall;



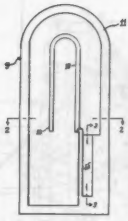
d. a forwardly extending horizontal top wall joined to the top edge of said rear wall and having a forward edge spaced from the plane of said lower front wall;
e. an upper inclined front wall integrally joined to said intermediate horizontal wall and extending between said inner edge of said intermediate horizontal wall and said forward edge of said top wall, respectively;
f. opposing side walls interconnecting said lower front wall and said rear wall along vertical fold lines, each of said side walls having a stepped upper edge defined by
aa. an intermediate horizontal edge adjacent said intermediate horizontal wall and coextensive therewith;
bb. an upper horizontal edge adjacent said top wall and coextensive therewith; and
cc. an inclined edge interconnecting said intermediate horizontal and upper horizontal edge, respectively;
g. a reinforcing panel joined to said inclined edge of each of said side walls and folded into underlying face-contacting relation with said upper inclined front wall;
h. a stabilizing flap joined to said reinforcing panel along a horizontal fold line and underlying said top wall;
i. and a top wall reinforcing flap joined to said upper horizontal edge of each of said side walls and folded into cooperating relation with said stabilizing flap.

3,978,983

CATHETERIZATION TRAY WITH LUBRICATION CHANNEL

Michael Warren Brezette, Roselle, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Nov. 4, 1974, Ser. No. 520,594
Int. Cl.² B65D *85/08*; A61M *25/00*
U.S. Cl. 206—364 6 Claims



1. In a tray useful for catheterization of a urethra by a urethral catheter, said tray having an upper surface with at least one compartment recessed therefrom for receiving said catheter or other implements necessary to said catheterization; the improvement which comprises:

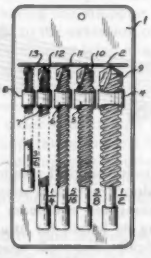
a lubrication channel for holding a lubricant while it is applied to said catheter, said channel recessed from said upper surface of said tray and closed at least at one end thereof, the length of said channel being substantially less than the length of said catheter and the lower surface of said channel arcuately rising to said upper surface at said closed end of said channel.

3,978,984

DRILL PACK HOLDER

William E. Cowley, Louisville, Ky., assignor to Vermont American Corporation, Louisville, Ky.

Filed Feb. 11, 1976, Ser. No. 657,149
Int. Cl.² B65D *85/20*, *85/24*
U.S. Cl. 206—379 4 Claims



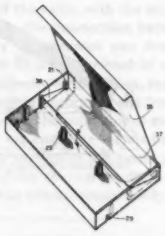
1. A holder for drills comprising a main planar sheet of tough flexible molded plastic having a front face and a back face, a thin transverse integral flange extending across the upper part of the front face of said sheet and lying at right angles to the plane of the main sheet, a series of parallel, vertically extending loops of graduated diameters corresponding to the sizes of the drills to be held thereby, and extending side-by-side in a row transverse to the longitudinal axis of the main sheet and being disposed a short distance below said flange, said loops being of graduated diameter for receiving and holding drills of corresponding diameters and lengths to fit with sliding clearance between the drills and the loops, the drills to be held thereby, said plate having pockets open at their upper ends toward the loops and being closed at their lower ends for receiving and holding with sliding clearance the lower ends of the articles to be mounted, the pockets being disposed at levels suitable for supporting the shanks of the drills with their upper ends substantially in a straight transverse line immediately below the aforesaid flange, the base plate extending upwardly above the flange a distance great enough to provide leverage for bending the base plate, in the region between said flange and said loops, to expose the upper ends of the supported drills for convenient grasping by the thumb and finger of the operator, said flexed portion of the back being resilient and when released springing back into substantially the plane of the sheet below the loops.

3,978,985

TWO-PIECE CASE

Gerald Boyd Zinnbauer, Carmel, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 30, 1975, Ser. No. 572,994
Int. Cl.² B65D *85/67*
U.S. Cl. 206—387 8 Claims



1. A case comprising a rigid rectangular receptacle and a rectangular cover formed from flexible sheet material, said receptacle having a pair of side walls, a front wall, and a bottom wall integrally connected together, said side walls having a pair of rear corners, a pair of pivot elements extending from the inner surfaces of said receptacle adjacent to and in closely spaced relationship to said side walls and said rear corners, said cover having two parallel fold lines defining a top panel, a rear panel and a bottom panel, said pivot elements being engaged with said bottom panel contiguous to said fold line between said bottom and rear panels for pivoting of said bottom panel thereabout from a closed position to an open position with said pivot elements further maintaining said rear panel adjacent said receptacle rear corners.

3,978,986

PROCESS AND APPARATUS FOR SEPARATING ASPHERICAL PARTICLES FROM SPHERICAL PARTICLES

Hartmut Schmidt, Wiesbaden-Bierstadt; Jürgen Neumann, Russelsheim, and Reinhold Arneth, Budenheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 31, 1974, Ser. No. 519,661
Claims priority, application Germany, Nov. 5, 1973, 2355135
Int. Cl.² B07C *9/00*
U.S. Cl. 209—112 1 Claim

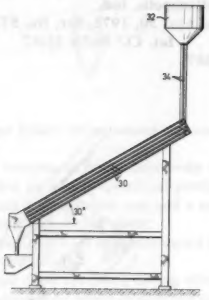
1. An apparatus for separating spherical particles from aspherical particles in an admixture thereof, comprising:

a. a base member;

b. a plurality of planar members substantially parallel to one another and spaced apart from one another, said plurality of planar members being secured to said base member at an inclined angle with respect to horizontal;

c. means, operatively associated with each planar member of said plurality of planar members, for directing said mixture of particles upon the associated planar member;

d. means, operatively associated with each planar member of said plurality of planar members, for producing a relative velocity between the associated planar member, on the one hand, and said particles, on the other hand, each relative velocity producing means including means for impinging said particles onto said planar member at a relative velocity having a principal directional component approximately normal to the steepest inclination gradient of the associated planar member; the plurality of particle



impinging means including a storage vessel for said particles elevated above said planar members and conduit means communicating with the inside of said vessel and leading to said planar members, each conduit means including outlet means angularly bent in the direction of the plane of each planar member; and

e. means positioned relative to said plurality of planar members for collecting a portion of said particles in a zone of said planar members wherein predominantly spherical particles have accumulated as a result of their greater tendency to roll in response to said relative velocity than said aspherical particles.

3,978,987

CUTTING OF A STREAM OF TOBACCO INTO MEASURED WEIGHT PORTIONS

Richard Ernest Gartside Neville, Salisbury, and Frank Baxter Bardsley, Newton Toney, both of England, assignors to AMF Incorporated, White Plains, N.Y.

Filed June 18, 1974, Ser. No. 480,453

Claims priority, application United Kingdom, July 3, 1973, 31664/73

Int. Cl.² B07C 5/16

U.S. Cl. 209—121 **25 Claims**

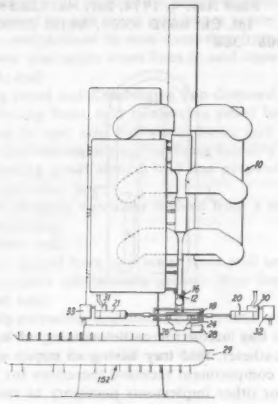
1. A method of dispensing portions of particulate material of predetermined weight, comprising

providing a flow of particulate material through a measuring area,

measuring the flow through the measuring area and providing a signal representing the measured flow rate of the particulate material,

integrating the flow rate signal with respect to time to provide a resultant signal of a value proportional to the total weight of the particulate material passed through the measuring area,

delivering the particulate material to a separating means and separating the particulate material in said separating means from the flow through the measuring area when



the value of the resultant signal is proportional to the desired predetermined weight.

3,978,988

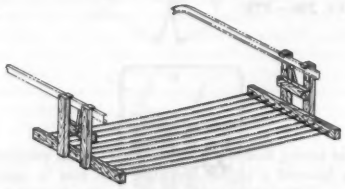
PORTABLE GARAGE CLOTHESLINE HOLDERS

Donna Lea Berg Friedeberg, 103 Farmstead Lane, Glastonbury, Conn. 06033

Filed Aug. 26, 1974, Ser. No. 491,937

Int. Cl.² D06F 53/04

U.S. Cl. 211—113 **1 Claim**



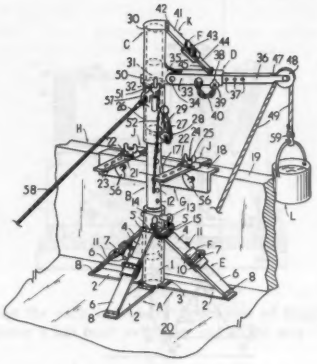
1. An overhead clothesline support adapted to be attached to an overhead garage door track, said support comprising a horizontally disposed elongated end-beam having two ends and having means along its length for attaching clothesline thereto, a pair of vertically disposed, spaced, beams each having a first end and a second end, the first end of each beam being secured to said end-beam intermediate the ends of the end-beam, a pair of J-shaped hooks opening downwardly and having a long leg and a short leg, the long leg of each hook being secured to the second end of a beam, said short leg of each hook lying in a plane spaced from the beams and being adapted to hook over the garage door track, a horizontally disposed crossbeam having ends and extending between the beams, said crossbeam being secured at its ends to the beams intermediate the first and second ends thereof, a brace extending upwardly from said crossbeam toward said plane of the hook short legs and said brace adapted to engage said garage door track to retain said J-shaped hooks in engagement with said track without interfering with garage door operation in said track.

3,978,989

EXTENSIBLE AND COLLAPSIBLE PORTABLE DERRICK

Fred Avila, Jr., 27318 Tyrrell Ave., No. C-6, Hayward, Calif. 94544

Filed Feb. 7, 1975, Ser. No. 548,086
Int. Cl.² B60P 1/46; B66P 23/00; B66C 23/62
U.S. Cl. 212—1 1 Claim



1. A portable derrick comprising:

a. a base including a hollow upright with hinged base members swingable outwardly into a plane that extends at right angles to the axis of said upright;

b. hinged braces interconnecting the outer ends of said base members with said upright and each consisting of two parts hinged together with removable clips holding said two parts in lineal alignment with each other when said base is in operative position;

c. an intermediate unit having an extension removably and slidably receivable in said upright with means for securing said intermediate extension in said upright in adjusted position;

d. a transversely extending bracket, angle-shaped in cross section and having the midpoint of its front face permanently secured to the extension of said intermediate unit, the top of said bracket lying in a plane which extends at right angles to the axis of said extension;

e. a hook disposed on each side of said extension and being adjustably received in sleeves secured to the top of said bracket, the outer ends of said hooks extending downwardly and cooperating with the front face of said bracket to form shoulder engaging members when said intermediate unit is freed from the hollow upright of said base when it is desired to carry the intermediate unit independently of said base;

f. means carried by said sleeves for securing said hooks in adjusted position therein for permitting said hooks to contact with one side of a building parapet and the front face of said bracket being disposed adjacent to the other side of the parapet, and hand screws on the front face for clamping the bracket to the parapet;

g. a top unit having a cap removably and rotatably mounted on the top of the extension for said intermediate unit;

h. an extensible arm pivotally secured to said cap and being swingable from a closed position, where the length of the arm parallels the axis of said cap, into an operative position where said arm projects radially from said cap, and a pulley mounted at the outer end of said arm; and

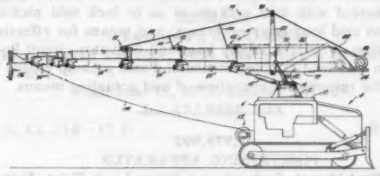
i. a hinged brace for supporting said arm in operative position, said cap and arm being rotatable around said extension.

3,978,990

MOBILE LOG SKIDDER

Thomas H. Honea, 11258 Slater Ave. NE., Kirkland, Wash. 98033

Filed July 12, 1974, Ser. No. 487,902
Int. Cl.² B66C 23/00
U.S. Cl. 212—9 21 Claims



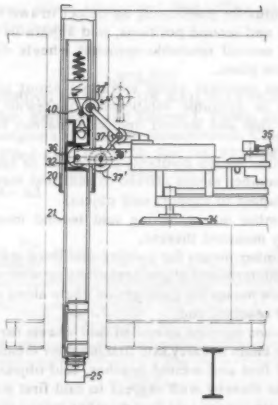
1. In a mobile log skidder, a carriage having an extensible and retractable multi-sectioned boom mounted thereon, free spooling cable winding winch means on the carriage having a haulback cable wound thereon independently of the boom, means connecting the haulback cable to an extensible section of the boom for payout of the cable with the section on extension of the boom, means in the connection between the cable and the section whereby an operator can detach the cable from the boom at the site of a log for haul in of the cable by the winch means independently of the boom, means for lowering and raising the extensible section of the boom in relation to the ground, and means on the attachment end of the cable for engaging a long, said log engaging means being releasably engaged on the extensible section of the boom and responsive to lowering and raising of the section to alternately engage a log and disengage from the boom, respectively.

3,978,991

STORAGE INSTALLATION WITH AUTOMATIC PICK-UP DEVICE

Uwe Kochanneck, 81, Neuer Graben, Dortmund, Germany (46)

Continuation-in-part of Ser. No. 442,715, March 26, 1974.
This application Aug. 15, 1974, Ser. No. 488,359
Claims priority, application Germany, Sept. 3, 1973, 2344329
Int. Cl.² B65G 61/00
U.S. Cl. 214—1 BT 3 Claims



1. A storage installation, comprising load-gripping means having a plurality of parallel telescopable elements surround-

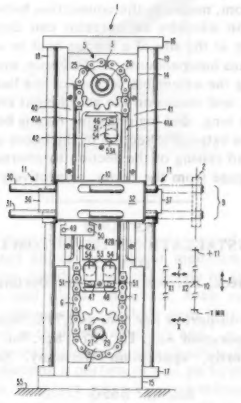
ing a central space and each including three telescopable sections; a socket in the center one of said telescopable sections of the respective telescopable elements; article pick-up means arranged to be positioned within said central space surrounded by said telescopable elements; locking means on said pick-up means and engageable in the respective sockets; actuating means responsive to telescoping-apart of the respective sections for actuating said locking means to cause engagement thereof with said sockets so as to lock said pick-up means to said load-gripping means; and means for effecting connection of current supply lines and activator circuit lines between said load-gripping means and said pick-up means in automatic response to operation of said actuating means.

3,978,992

POSITIONING APPARATUS

Alfred Paul Mulzet, Endicott, and James Louis Sirico, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 2, 1975, Ser. No. 592,584
Int. Cl.² B65G *25/00*
U.S. Cl. 214—1 BB **21 Claims**



1. Apparatus for positioning an object to two spatially displaced first and second positions, said apparatus comprising:

first and second rotatable sprocket wheels disposed in a common plane,

an endless sprocket chain entrained about said sprocket wheels in operable relationship therewith, said chain having first and second opposing reaches between said wheels,

first member means pivotably connected to said chain,

second member means affixed to said first member means and adapted to support said object,

third member means having said second member means slidably mounted thereto,

guide member means for guiding said third member means in a predetermined aligned relationship with said reaches,

chain guide means for guiding said chain along said first and second reaches, and

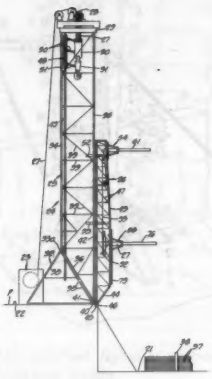
driver means coupled to one of said wheels for driving said endless chain to carry said first member means along each of said first and second reaches, said object being positionable thereby with respect to said first position when said chain carries said first member means along said first reach, and said object being positionable thereby with respect to said second position when said chain carries said first member means along said second reach.

3,978,993

VERTICALLY ADJUSTABLE PIPE RACKING APPARATUS

James A. Howard, Houston, Tex., assignor to Byron Jackson, Inc., Long Beach, Calif.

Continuation of Ser. No. 433,331, Jan. 14, 1974, abandoned.
This application June 24, 1975, Ser. No. 589,830
Int. Cl.² E21B *19/00*
U.S. Cl. 214—2.5 **16 Claims**



1. A well drilling rig comprising: a vertically disposed supporting structure having hoist mechanism therein for raising and lowering a string of drill pipe with respect to the floor of the rig, pipe rack means in said supporting structure at one side thereof for removably storing vertically disposed lengths of pipe, upper pipe racker means carried by said supporting structure, lower pipe racker means carried by said supporting structure and spaced below said upper pipe racker means, each of said pipe racker means including a horizontally disposed racker arm having an inner end provided with a pipe engaging head, means supporting said respective racker arms for horizontal movements to move a length of generally vertically disposed pipe engaged by said heads between the center of said supporting structure and said pipe rack means, motor means for moving said racker arms as aforesaid, means mounting said lower racker means for vertical movement with respect to said supporting structure, and hoist means directly connected to said lower racker means for raising and lowering the latter.

3,978,994

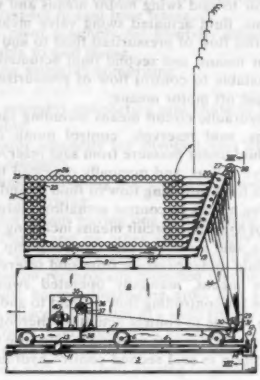
PIPE RACK WITH PIVOTED FINGERS

Homer J. Woolslayer, and Cecil Jenkins, both of Tulsa, Okla., assignors to Lee C. Moore Corporation, Tulsa, Okla.

Filed July 7, 1975, Ser. No. 593,473
Int. Cl.² E21B *19/14*
U.S. Cl. 214—2.5 **10 Claims**

1. A drill pipe rack comprising a plurality of vertically spaced rows of laterally spaced fingers, the fingers in each row being formed at longitudinally spaced points along them for supporting laterally spaced drill pipe extending across the fingers, a carriage beneath said fingers, means mounted on the carriage pivotally supporting said fingers at one common end on transverse horizontal axes, means for moving the carriage from a starting location step by step in a direction lengthwise of the horizontal fingers to first locate at a pipe pick-up station a pipe supported by the fingers in the upper row nearest their free ends and then each successive pipe in that row until all of the pipe have been removed from that row, means for thereafter swinging said upper row of fingers up out of the way, and

means for returning the carriage to said starting location, whereby said step by step movement of the carriage can be



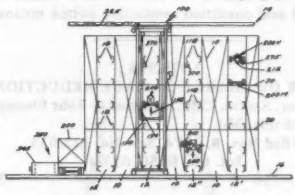
repeated for each successive upper row of fingers after the row above it has been swung up out of the way.

3,978,995

MOBILE TIER PICKING APPARATUS FOR A WAREHOUSING SYSTEM

Howard A. Zollinger, Ada Township, Kent County, and LeRoy Lubbers, Grand Rapids, both of Mich., assignors to Rapistan, Incorporated, Grand Rapids, Mich.

Division of Ser. No. 332,903, Feb. 15, 1973, Pat. No. 3,866,767. This application Nov. 11, 1974, Ser. No. 522,724
Int. Cl.² B65G *1/06*
U.S. Cl. 214—16.4 A **5 Claims**



1. In a materials handling system including storage racks with an array of storage locations for receiving and storing tiered articles and including access aisles extending adjacent the storage locations and having a pair of vertically spaced guide and support means thereon extending along discrete storage levels to provide access to an open end of each of the storage locations in the system, means for transferring tiers of articles within the system comprising:

a mobile tier picking vehicle for movement within a preselected access aisle along the upper one of a pair of vertically spaced guide and support means at a preselected discrete storage level within said aisle to transfer tiered articles within the storage aisle;

a picking head movably positioned on said tier picking vehicle for picking tiers of articles from unitized loads of tiered articles in said storage racks;

means for aligning in a predetermined manner a unitized load of tiered articles stored within said system and said picking head;

a separate independently operable mobile make-up vehicle dispatched on the lower one of said pair of vertically spaced guide and support means in said preselected aisle below and aligned under said tier picking vehicle to receive picked tiers of articles from said picking head of said mobile transfer picking vehicle; and

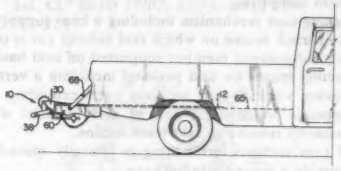
control means for moving said picking head into contact with said tier of articles and for shifting the position of said picking head to transfer said tier of articles from said unitized load to said mobile transfer vehicle.

3,978,996

TAILGATE UNLOADER

Victor Conrad Oltrogge, 6054 Queen Court, Arvada, Colo. 80004

Filed Jan. 15, 1975, Ser. No. 541,156
Int. Cl.² B60P *1/38*
U.S. Cl. 214—17 D **8 Claims**



1. Apparatus for conveying objects or materials from a storage location which has a flat bed area and side walls enclosing the flat bed area except at one open or openable edge with the flat bed area having first and second spaced parallel surfaces along the edge comprising:

a beam having a length substantially the same as said open edge and having spaced side plates extending outwardly therefrom in perpendicular offset relation to the length of said beam,

a roller means rotatably attached between said side plates,

clamping means surroundingly engageable with said first and second surfaces for releasably attaching said beam to said open edge so that the axis of said roller is substantially parallel to said open edge of the flat bed area,

a flat flexible belt atttached to said roller means and having a length sufficient for extending from said roller means into at least a portion of the flat bed area,

a source of rotary power, and

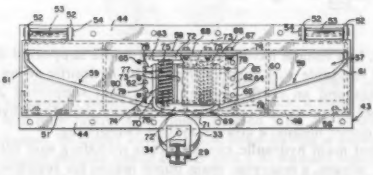
transmission means for coupling said rotary power source to said roller means, whereby any object or material placed upon said flexible belt when extended into the flat bed area can be moved towards said roller means by actuating said rotary power source and thus rolling said belt upon said roller means.

3,978,997

DOOR TRIPPING DEVICE FOR RAILWAY HOPPER CAR

Roy W. Miller, Highland, and Eugene I. Varda, St. John, both of Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Apr. 28, 1975, Ser. No. 572,684
Int. Cl.² B65G *67/24*
U.S. Cl. 214—63 **10 Claims**



1. In a railway hopper car having a body structure and a hopper, bottom dump door means hingedly connected to said

body for hinging movement downwardly about a longitudinal axis from a closed to a discharge position;

a bell crank shaped lever having a substantially upright arm and a laterally extending arm,

first pivot means connecting said lever to said body for pivotal movement about a longitudinal axis,

a strut including second pivotal means connected to said laterally extending arm and third pivotal means connecting said strut to said door means,

said second pivotal means in a closed position of said door being disposed in an over-center position relative to said first pivotal means and said third pivotal means,

a stop carried on said body limiting the movement of said door means to said over-center position,

cam engageable means on said upright arm, the improvement comprising,

a closing cam mechanism including a base supported adjacent track means on which said railway car is traveling,

a vertical pedestal member supported on said base,

camming means on said pedestal including a vertical cam having vertical cam sections each extending from an opposite longitudinal end of said pedestal diagonally inwardly relative to said track means,

said cam sections terminating in laterally spaced ends to provide a space there-between,

said pedestal including a laterally extending pocket communicating with the space provided by said lateral ends,

a laterally movable cam disposed in said pocket,

said cam including an outer cam surface extending from said pocket to provide a continuous camming surface with said cam sections,

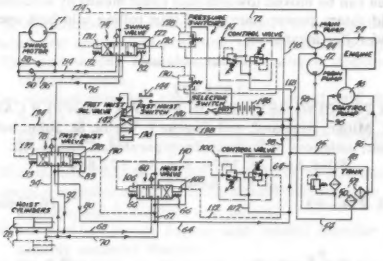
and biasing means within said pocket for biasing said outer cam surface in a lateral direction toward said track means, whereby said cam engageable means initially engages and travels along one of said cam sections during movement of said car and thereupon engages said biased laterally movable cam which exerts an inwardly directed force for moving said lever to its over-center position.

3,978,998

FAST HOIST CONTROL SYSTEM

Ronald J. Klitz, Mosinee, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed May 16, 1975, Ser. No. 578,112
Int. Cl.[2] E02F *3/00*
U.S. Cl. 214—132 **5 Claims**



1. In a vehicle having an upper structure supported thereon and rotatable with respect thereto by hydraulic swing motor means and an earth working implement supported on said upper structure and movable with respect thereto by hydraulic lift motor means, a control system comprising:

first main hydraulic circuit means including said lift motor means, a reservoir, main pump means for supplying pressurized fluid from said reservoir to said lift motor means, and first fluid actuated lift valve means actuatable to control flow of pressurized fluid to and from said lift motor means;

second main hydraulic circuit means including said swing motor means, said lift motor means, said reservoir, said main pump means for supplying pressurized fluid from said reservoir to said swing motor means and to said lift motor means, fluid actuated swing valve means actuatable to control flow of pressurized fluid to and from said swing motor means, and second fluid actuated lift valve means actuatable to control flow of pressurized fluid to and from said lift motor means;

first control hydraulic circuit means including said first lift valve means, said reservoir, control pump means for supplying fluid under pressure from said reservoir to said first lift valve means, and manually operated lift control valve means for controlling flow of fluid to and from said first lift valve means to control actuation thereof;

second control hydraulic circuit means including said swing valve means, said reservoir, said control pump means for supplying fluid under pressure from said reservoir to said swing valve means, manually operated swing control valve means for controlling flow of fluid to and from said swing valve means to control actuation thereof, and normally closed switch means opening in response to a preselected condition in said second control hydraulic circuit means;

third control hydraulic circuit means including said second lift valve means, said reservoir, said control pump means for supplying fluid under pressure from said reservoir to said second lift valve means, and second lift control valve means for controlling the flow of fluid to and from said second lift valve means to control actuation thereof; and

fourth control circuit means including said normally closed condition responsive switch means selectively operable switch means connected to said condition responsive switch means for selectively actuating said second lift control valve means and thereby said second lift valve means when said condition responsive switch means is closed, and means selectively operable to bypass said condition responsive switch means,

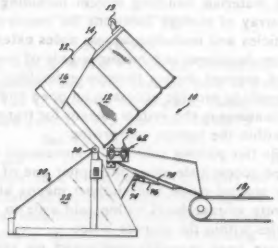
whereby said selectively operable switch means selectively actuates said second lift control valve means independently of said condition responsive switch means.

3,978,999

CONTAINER DISCHARGE DAMAGE REDUCTION FLAP

James J. Ryder, Santee, Calif., assignor to Rohr Plessey Corporation, Rockville, Md.

Filed Nov. 8, 1974, Ser. No. 522,033
Int. Cl.[2] B65G *65/04*
U.S. Cl. 214—314 **3 Claims**



1. A hamper dumper comprising:

a base frame,

a cradle having means to receive a hamper that is to be unloaded,

means pivotally attaching said cradle to said base frame,

means for pivoting said cradle with respect to said base frame from a loading position to a dumping position,

a chute assembly that functions as a cover for the top of a hamper when it is positioned on said cradle,

said cradle and said chute assembly are attached to each other so that they normally pivot together as one member with respect to said base frame,

a chute pivot assembly for pivotally attaching said chute assembly to said frame,

said chute assembly comprising:

a chute,

a hinge assembly connecting said chute to said chute pivot assembly,

an actuator assembly for pivoting said chute about said hinge assembly,

said means for pivoting said cradle with respect to said base frame comprising:

first motor means having one end pivotally secured to said base frame and its other end pivotally secured to said cradle, said motor means comprising a hydraulic cylinder with piston reciprocally mounted therein, and

said cradle having upstanding arms that are pivotally secured adjacent their tips to a shaft fixedly attached to said base frame, said chute pivot assembly comprising a transverse plate secured to the bottom surfaces of a U-shaped stiffener with said shaft passing longitudinally within said enclosure formed by said transverse plate and said U-shaped stiffener, the ends of transverse plate and said U-shaped stiffener being fixedly secured to said upstanding arms whereby said cradle and said chute pivot assembly as a single member.

3,979,000

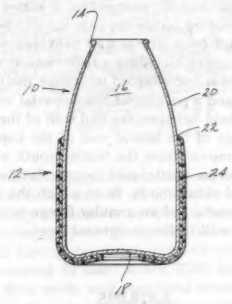
CONTAINER WITH IMPROVED HEAT-SHRUNK CELLULAR SLEEVE

James A. Karabedian, Garden City, N.Y., assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 505,646, Sept. 13, 1974. This application Mar. 5, 1975, Ser. No. 555,507

Int. Cl.² B65D *11/16*

U.S. Cl. 215—12 R **16 Claims**



1. In an article of manufacture comprising a container having an annular rim defining a mouth opening at one end thereof, a lower end providing a bottom thereof, and an annular wall interposed said rim and said lower end, and further including a heat-shrunk, polymeric sleeve disposed circumferentially outwardly of said wall and in snug engagement therewith, the improvement wherein said polymeric sleeve is a composite structure of a closed cellular polymeric layer preponderantly of polystyrene having incorporated therein, in an amount from zero weight percent up to compatible amounts, a copolymer of ethylene and vinyl acetate, or a copolymer of ethylene and an alkyl ester of an alpha-beta monoethylenically unsaturated carboxylic acid, or a copolymer of ethylene and an alpha-beta monoethylenically unsaturated carboxylic acid, or mixtures thereof, and a non-cellular polymeric layer having preponderantly ethylene moieties and incorporated therein moieties of vinyl acetate or an alkyl ester of an alpha-beta monoethylenically unsaturated carboxylic acid, or an alpha-beta monoethylenically unsaturated carboxylic acid, or mixtures thereof, the amount of said incorporated moieties in said non-cellular layer being sufficient to promote the adhesion of said layers, said cellular layer being disposed outwardly of said non-cellular layer and said non-cellular layer being disposed intermediate said cellular layer and said wall.

3,979,001

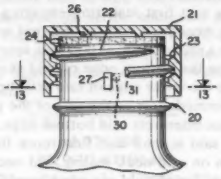
SAFETY CLOSURE FOR CONTAINERS

Clayton Bogert, 118 Lowell Road, Glen Rock, N.J. 07452

Continuation-in-part of Ser. No. 311,119, Dec. 1, 1972, abandoned. This application Nov. 29, 1974, Ser. No. 516,231

Int. Cl.² B65D *55/02, 85/56;* A61J *1/00*

U.S. Cl. 215—217 **6 Claims**



1. A safety closure for containers comprising a neck portion provided with a thread and a stop disposed adjacent to the terminus of the thread,

a cap provided with a thread for cooperatively engaging the thread on the neck portion,

protrusion means disposed in the cap adapted to engage the stop on the neck portion when the cap is threaded on the neck portion,

said protrusion means occupying the space between the stop and the terminus of the threads on the neck portion when the cap is in closed position, and

a pressure member interposed between the underside of the top of the cap and the top of the neck portion.

3,979,002

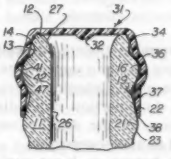
TEARABLE SKIRT PLASTIC WATER BOTTLE CAP

George W. Faulstich, San Carlos, Calif., assignor to Three Sisters Ranch Enterprises, San Carlos, Calif.

Filed Jan. 13, 1975, Ser. No. 540,397

Int. Cl.² B65D *41/48*

U.S. Cl. 215—256 **4 Claims**



1. In combination a container having a container neck having an annular finish at the end of said neck, a short cylindrical terminus below said finish formed with an external screw thread, an upper external first bead having a substantially circular arcuate upper corner and a downward tapering lower curvature ending in a minimum diameter portion and a second bead below said minimum diameter portion; and a cap of a flexible plastic material, said cap deformable to accommodate minor variations in container dimensions and also to

permit said cap to stretch over said first bead, said cap preformed, said cap comprising a flat top disk having a diameter about equal to that of said finish, an external third bead below said disk complementary to and tightly engaging said first bead down to the upper end of said lower curvature, an imperforate vertical skirt below said external third bead having a diameter less than said first and second beads of said neck, and a short depending upper skirt around the periphery of said top disk above said external third bead and having an inside diameter slightly greater than said terminus and equal to said threads, said third bead being weakened in a first score line located opposite said downward tapering lower curvature and below the maximum diameter portion of said first bead, said first score line having an arcuate length of about 180°, said skirt formed with a thickened internal terminus at a first end of said first score line to limit tearing of said skirt, said skirt being formed with an internal, circumferential thin, flexible first leak ring immediately above said first score line and engaging said maximum diameter portion of said first bead and with an internal, circumferential, thin, flexible second leak ring above said first leak ring engaging said first bead, said skirt being weakened with an internal second score line extending from a second end of said first score line and slanting downward to the bottom edge of said skirt and a pull tab depending from the lower edge of said skirt below said second score line and immediately to the side of the point where said second score line intersects said bottom edge, said skirt being tearable along said second and first score lines, said cap in intact condition on said neck sealing said neck against either input or output of liquid, said cap when torn along said second and first score lines permitting removal of said cap from said neck.

3,979,003

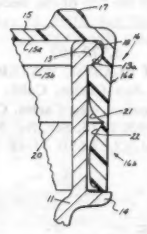
RE-USABLE FRANGIBLE CLOSURE

David O. Allen, Martinsville, Ohio, assignor to Buckeye Molding Co., New Vienna, Ohio

Continuation of Ser. No. 387,352, Aug. 10, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 557,083

Int. Cl.² B65D *41/32*

U.S. Cl. 215—256 **5 Claims**



1. A resilient deformable closure for sealing and/or re-closing a container having an open upper edge comprising

a body formed of a molded plastic material and having a top portion and a skirt portion depending therefrom and having all portions of the distal extremity of said skirt portion parallel to said top portion.

said skirt portion having an inner surface forming a re-entrant portion joined to the inner surface of said top portion and sealingly engaging the open upper edge and outer surface of a container when the closure is mounted thereon,

a score line on said inner surface of said skirt portion forming a continuous weakened section in said skirt portion at a location between the distal extremity thereof and said re-entrant portion and forming a removable skirt portion between said weakened section and said distal extremity, and

removal means including a pair of spaced-apart terminal tabs connected to said removable skirt portion and disposed between said weakened section and said distal extremity, said skirt portion also having an outer surface portion disposed above said weakened section and adjacent said pair of terminal tabs and recessed inwardly from other portions of the outer surface of said skirt portion, the peripheral extent of said recessed portion being slightly greater than the spacing between said terminal tabs to facilitate lifting and grasping thereof.

3,979,004

BOTTLE CAP

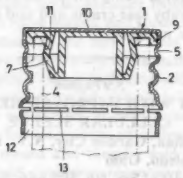
Luigi Bertario, Milan, Italy, assignor to Alluminio Mauceri Borghetto S.p.A., Milan, Italy

Filed Dec. 11, 1974, Ser. No. 531,744

Claims priority, application Italy, Dec. 11, 1973, 3003/73[U]

Int. Cl.² B65D *53/00*

U.S. Cl. 215—341 **3 Claims**



1. A cap-and-stopper assembly for closing a bottle having an exteriorly threaded mouth, comprising a screw cap and a resilient stopper located inside the cap, the cap being formed by an end wall and by a lateral wall provided with internal threads and the stopper including a twin-conical wall tapered toward opposite ends and adapted to engage the inner wall of the bottle mouth and a peripheral bead coaxial with the twin-conical wall and held between the end wall of the cap and an annular inner ledge of the lateral wall of the cap so that the stopper will be removed from the bottle mouth when the cap is unscrewed from the bottle, said stopper further includes a central cylindrical closed body, from which the twin-conical wall coaxially extends, and an annular flange which connects said twin-conical wall to the peripheral bead.

3,979,005

CRYOGENIC TANK AND AIRCRAFT STRUCTURAL INTERFACE

Robert K. Robinson, Mercer Island, and Philip C. Whitener, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

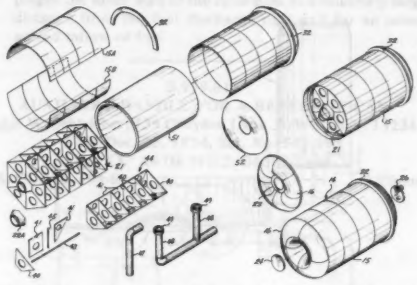
Division of Ser. No. 469,583, May 13, 1974, Pat. No. 3,951,362. This application Mar. 17, 1975, Ser. No. 558,578

Int. Cl.² B65D *25/04, 81/00, 85/70, 87/24*

U.S. Cl. 220—9 LG **8 Claims**

1. A container for fluids, comprising: a cylindrical center section with toroidal-ring surface end members; a baffle assembly positioned within the container to prevent undue sloshing of its contents; said baffle assembly having a core structure interconnecting the toroidal-ring surface end members for supporting the baffle assembly in spaced relation to the interior wall surfaces of the container; said baffle assembly

core structure being supportably attached to the central portion of the toroidal-ring surface end members for reacting to



sloshing fluid pressure loads imposed on the baffle assembly through said toroidal-ring centers.

3,979,006

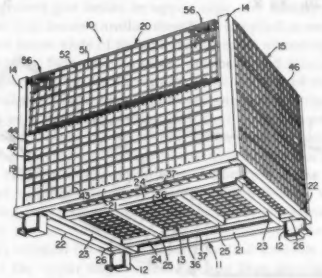
RIGID CONTAINER

Stanley J. Jurasek, Concord Township, Jackson County, Mich., assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Division of Ser. No. 323,513, Jan. 15, 1973, Pat. No. 3,907,150. This application July 28, 1975, Ser. No. 599,402

Int. Cl.² B65D *7/20*

U.S. Cl. 220—19 **3 Claims**



1. A material handling container, comprising:

a deck bed comprised of structural members forming a substantially rectangular peripheral frame, said structural members being upwardly opening substantially U-shaped channels having parallel inner and outer upright walls interconnected at their lower ends by transversely extending base walls, said structural members being joined together at their ends to define upwardly opening, closed bottom sockets at the corners of said peripheral frame wherein the sidewalls of said sockets are defined by the inner and outer upright walls of said structural members and the closed bottom walls of said sockets are defined by the base walls of said structural members;

legs secured directly to the underside of the deck bed adjacent to the corners of said rectangular peripheral frame, said legs extending downwardly from the deck bed for engagement with a support surface or for stacking on another container of the same dimensions;

a plurality of upright rigid posts secured to and extending upwardly from said peripheral frame at the corners thereof, and with their lower end portions being disposed in said sockets, said posts each consisting essentially of an angle member having two flanges extending a right angle to each other, the lower ends of said posts substantially bottoming against the base walls of said structural members and the outer surfaces of the lower end portions to the two flanges of said posts being in abutting face-to-face contact with and extending parallel to the inner surfaces of the outer upright walls of the structural members and being welded thereto, said posts being separate from said legs and being connected thereto only by said deck bed;

upright wire mesh walls extending between and rigidly secured to said posts and defining a rigid, non-foldable enclosure extending upwardly from said deck bed, said wire mesh walls being comprised of vertically spaced, horizontally extending rods whose opposite ends extend into overlapping abutting face-to-face contact with the inner surfaces of the flanges of said posts and are welded thereto, said wire mesh walls also having horizontally spaced, vertically extending rods whose lower ends extend into overlapping abutting face-to-face contact with the inner surfaces of the outer walls of said structural members and are welded thereto;

a horizontal bottom wall of wire mesh construction extending across the bottom of the enclosure and comprising rods whose end portions extend across the upper ends of said structural members and are welded to the upper edges of the inner and outer upright walls of said structural members.

3,979,007

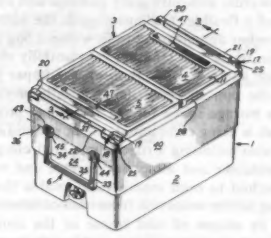
PICNIC COOLER

Bruce Norman Thornbloom, Jr., Clinton, Mass., assignor to Bee Plastics Corporation, Chicago, Ill.

Filed Oct. 16, 1975, Ser. No. 623,014

Int. Cl.² B65D *25/04, 25/28, 43/16*

U.S. Cl. 220—23 **12 Claims**



1. An improved container having a lid and handle assembly comprising:

a. a container body having walls and a bottom defining therebetween a useful volume;

b. at least one lid having an inside and an outside surface, said lid being pivotally mounted on one of said walls;

c. at least one handle pivotally mounted on one of said walls;

d. said pivotal handle mounting being adapted to provide for motion of said handle through an arc from a first, lowered position to a second, raised position;

e. said handle having a cross member and at least one depending arm;

f. first means for limiting the rotational motion of said arm disposed in cooperating relation to said arm and said wall to space said crosspiece from said wall a distance sufficient to prevent discomfort of the hand of a person carrying said container by said handle;

g. second means for cooperatingly engaging said handle crosspiece when in said raised position, said engaging means being disposed in association with the outside surface of said lid;

h. third means for preventing outward and downward rotational motion of said handle and to retain said lid in a substantially horizontal position thereby providing a use-

ful work space on said inner surface of said lid when said lid is in the open position, said third, handle motion preventing means being disposed adjacent and in cooperating relation with said second engaging means on said lid.

3,979,008

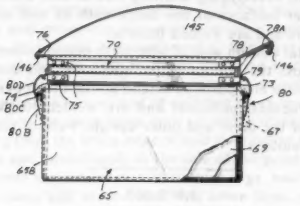
REMOVABLE RECEPTACLE FOR TRASH COMPACTOR

Charles B. Weeks, Boston, and Paul V. Choate, Milton, both of Mass., assignors to Norris Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 515,675, Oct. 17, 1974. This application May 27, 1975, Ser. No. 580,578

Int. Cl.² B65D *39/00*

U.S. Cl. 220—65 **6 Claims**



1. A trash-receiving unit for holding a bag in a trash-receiving position in a trash compactor, said unit comprising a pan member including side walls of flexible, resilient plastic, and dimensioned to receive a substantial part of a bag, and an open top, open bottom container member the walls of which are downwardly and outwardly inclined and extend above the pan and of a flexible, resilient plastic, the bottom of the container member dimensioned to fit within a bag and seat against the bottom of the pan member substantially at the junction of the bottom and side walls thereof, the upper part of the side walls of the pan spaced from the walls of the container to provide a storage space for the remaining portion of the bag while trash is being compacted, the upper end of the container member also including a rigid frame encircling the upper end of the container and attached thereto, and means including parts attached to both members to enable the two members and a bag to be removed from the compactor and carried together by means of said frame or the container member removed and the pan member and bag to be carried together by means of the pan.

3,979,009

CONTAINER BOTTOM STRUCTURE

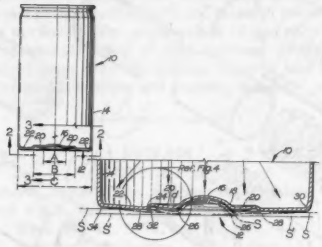
Charles E. Walker, Walnut Creek, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 560,456, March 21, 1975, abandoned. This application Oct. 17, 1975, Ser. No. 623,271

Int. Cl.² B65D *7/42*

U.S. Cl. 220—66 **21 Claims**

1. A seamless metal container body comprised of a sidewall and a bottom having controlled distention characteristics and formed integrally with the lower extremity of the said sidewall, said bottom having a centrally and inwardly disposed relatively shallow dome-like depression the outer peripheral edge of which terminates in a slight upwardly and outwardly projecting dished section, the outer extremity of the said dished section merging with a generally planar section, and the outer periphery of said planar section merging with the sidewall, said planar section constituting at least a substantial part of the total cross-sectional area of the said bottom and the point of mergence of the dished section and said generally planar section being comprised of a selectively thinned and work hardened portion having distortion resistant hoop-like strength characteristics, and said last mentioned portion also acting as a relatively stiff hinge about which the central part of the container bottom including the dished section is allowed to flex selectively outwardly beyond the outermost



plane of the outer surface of the planar section when the overall bottom flexes and is distended outwardly a controlled amount under the influence of internal pressures within the container body.

3,979,010

FUEL TANK FOR A MOTOR VEHICLE

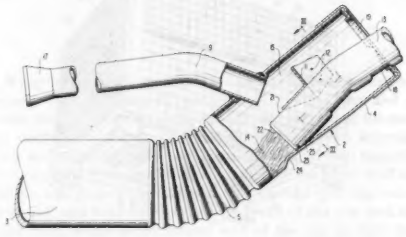
Horst Fiedler, Stuttgart; Walter Schuller, Winnenden-Schelmenholz, and Manfred Distel, Ruit, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed July 12, 1974, Ser. No. 488,157

Claims priority, application Germany, July 17, 1973, 2336239

Int. Cl.² B65B *1/04*

U.S. Cl. 220—86 R **5 Claims**



1. A fuel tank with a rear wall for an automotive vehicle, comprising

a filler pipe terminating in the upper portion on one side of the rear wall and having sections extending obliquely to the rear wall in a horizontal plane;

a rectilinear rear section of the filler pipe extending rearwardly from said sections at an inclination and being provided with an opening for the insertion of a fuel discharge pipe;

support means located in the opening defining an aperture of smaller area than that of the opening and providing a sufficient passage means for venting of air from the fuel tank, a portion of the opening being of larger area than the aperture defined by the support means being located to the rear of the support means as viewed in the inflow direction of fuel during a filling operation such that the fuel discharge pipe rests against a lower edge of the large area portion of the opening and an upper surface of the fuel discharge pipe rests against the support means;

a vent pipe from the fuel tank terminating in the filler pipe to the rear of the support means as viewed in the inflow direction of the fuel; and

the rear section having a lower inner wall with an inwardly formed step-like indentation as viewed in the inflow di-

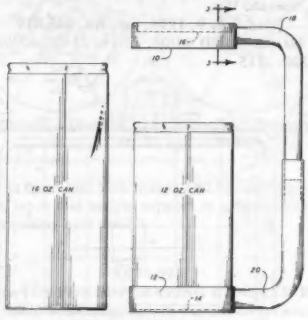
rection of fuel directly downstream of the lower inner surface of the opening upon which the fuel discharge pipe always rests during the filling operation so that fuel impinges the inner wall of the filler pipe at a relatively large distance from the fuel discharge pipe exit for an unimpaired inflow of fuel.

3,979,011

AUXILIARY HANDLE FOR A BEVERAGE CAN

Roger W. Schleicher, 139 Croyden Lane, DeWitt, N.Y. 13224

Filed Dec. 23, 1974, Ser. No. 535,273
Int. Cl.² A47G *19/22;* **B65D** *25/28*
U.S. Cl. 220—94 R **2 Claims**



1. An auxiliary handle for a beverage can formed with an annular groove just inside its upper edge, the handle comprising upper and lower annular members adapted to engage the upper and lower ends of the can, and tubular elements extending outwardly from the annular members and telescopically engageable with one another to form the portion of the handle that is grasped by the user, the lower annular member having the form of a vertically walled ring that extends upwardly to form a band around the lower end of the can, the lower annular member having an inwardly extending horizontal flange at its lower edge for engagement with the bottom of the can, and the upper annular member having the form of a vertically walled ring that extends downwardly to form a band around the upper end of the can, the upper annular member having a flexible, integral lip at its upper edge that extends inwardly to overlie the upper edge of the can and then downwardly to extend into the annular groove that is inside thereof, the flexibility of the lip permitting it to extend into the annular grooves of standard beverage cans of different diameters.

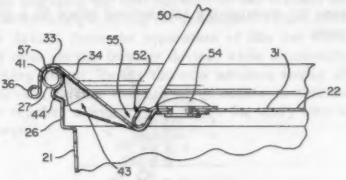
3,979,012

CONTAINER HAVING OPENING MEANS

Horst F. W. Arfert, and Edward D. Gardner, both of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Dec. 22, 1975, Ser. No. 643,527
Int. Cl.² B65D *51/16*
U.S. Cl. 220—231 **10 Claims**

1. A container comprising, a deformable metal container body adapted to contain a product therein and having a bottom wall and a side wall which has a tubular upper portion terminating in a first circumferential bead defining an open end in said container body, a deformable metal closure for said container body, said closure having a main body portion adjoined at its outer edge by an annular flange, said flange having a generally U-shaped cross-sectional configuration defined by a bight with an inner leg portion and an outer leg portion extending from opposite ends of said bight, said inner leg portion adjoining said main body portion and said outer leg portion terminating in a second circumferential bead, an annular indentation in said inner leg portion of said flange and said tubular upper portion beneath said first bead, said annular indentation providing a seal between said closure and container body, and force transmitting means provided as a part of said closure for permanently deforming at least part of



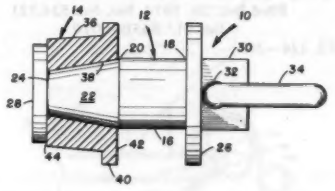
said main body portion within said container body and causing at least a portion of said inner leg portion to be pulled away from said tubular upper portion and first bead thereby enabling removal of said closure by lifting upwardly on said closure.

3,979,013

PUSH PLUG

Harry R. Schulte, Gaithersburg, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 12, 1974, Ser. No. 505,395
Int. Cl.² B65D *53/00*
U.S. Cl. 220—234 **11 Claims**



1. A readily insertable and removable closure plug comprising:

an elongated expander core comprising at least two longitudinally adjacent segments, a first segment cylindrical in cross-sectional shape, and a second segment tapering in cross-sectional shape, said second segment having a cross-sectional diameter varying from at one end essentially equal to the cross-sectional diameter of said first cylindrical segment to a smaller cross-sectional diameter at the other end; and

an annular deformable sealing member positioned circumferentially on and deformable by longitudinal movement of said expander core, said sealing member having tapered inner and outer surfaces.

3,979,014

SEAL DEVICE FOR USE IN FLANGE MATING SURFACES OF VACUUM CONTAINER

Hiroo Iwase, Juochd, and Satoshi Ninomiya, Hitachi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 26, 1974, Ser. No. 527,230
Int. Cl.² B65D *53/00*
U.S. Cl. 220—240 **10 Claims**

1. In a seal device for use in the flange mating surfaces of a container of the type, in which there are provided a first member and a second member both having flanges which are fastened together by means of fastening members; the improvements comprising:

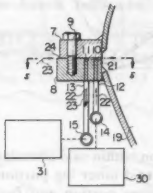
a first space and a second space defined in said flange mating surfaces of said first and second members;

sealing fluid guide holes defined in either of said flanges;

sealing fluid discharge holes defined in either of said flanges;

a sealing fluid generating source; and

means for maintaining said second space to a given pressure;



said first space being located inwardly of said fastening members in said mating surfaces of said flanges and communicated with said sealing fluid guide holes which are communicated with said sealing fluid generating source; and said second space being communicated with said sealing fluid discharge holes which are communicated with said means for maintaining said second space to a given pressure.

3,979,015

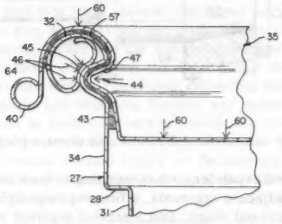
CONTAINER

Horst F. W. Arfert, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Dec. 20, 1974, Ser. No. 534,721

Int. Cl.² B65D *43/10*

U.S. Cl. 220—307 **15 Claims**



1. A container comprising, a metallic container body adapted to contain a product therein and having a bottom wall and a side wall terminating in a first deformable circumferential bead of substantially tubular toroidal form defining an open end in said container body, a deformable metallic closure for said container body, said closure having a main portion adjoined at its outer edge by an annular flange, said flange terminating in a second circumferential bead, force transmitting means provided as an integral part of said main portion, seal means between said closure and first bead, and an annular indentation in said flange and first bead which cooperates with said seal means to provide an improved seal between said closure and said first annular bead, said flange having a roughly U-shaped cross-sectional configuration defined by a bight having an inner leg portion and an outer leg portion with said leg portions extending downwardly from opposite ends of said bight and said annular indentation being in the form of a roughly V-shaped indentation in said inner leg portion and in said first bead, said annular indentation positions said closure on said container body and simultaneously results in a deformation of a portion of said first bead which is a part plastic deformation and a part elastic deformation, said part elastic deformation causing said portion of said first bead to be resiliently urged more tighly against said closure, said resiliently urged portion cooperating with said seal means to provide said improved seal, said force transmitting means causing release of said inner leg portion of said flange away from said first bead by shearing said seal means upon urging and permanently deforming at least part of said main body portion toward the center of said container body enabling removal of said closure simply by lifting upwardly against said second bead.

3,979,016

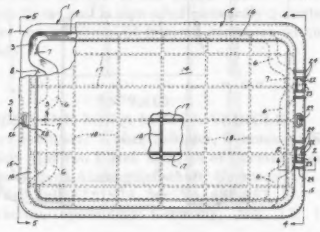
SECURITY COVER FOR A CONTAINER

James J. Frater, Watertown, Wis., assignor to Menasha Corporation, Neenah, Wis.

Filed Feb. 9, 1976, Ser. No. 656,819

Int. Cl.² B65D *43/08, 45/16, 21/00, 45/00*

U.S. Cl. 220—315 **13 Claims**



1. A container assembly, comprising a container having a pair of opposed first walls and a pair of opposed second walls and a bottom wall connecting the first and second walls, said container also having a rim connected to the upper edges of the first and second walls and terminating in a downwardly extending flange, a cover to enclose the upper end of the container, said cover having a surface resting on said rim and having a downwardly extending flange located outwardly of the container flange, a hook member connected to the flange of the cover and terminating in an upwardly extending section disposed generally parallel to the flange on the cover and disposed inwardly of the flange of the container, and a tab connected to the flange of the cover and spaced from the hook member, said tab disposed in engagement with the lower edge of the flange on the container.

3,979,017

ARTICLE DISPENSING APPARATUS

Francis Charles O'Toole, Lafayette Hill, and Charles Philip Comeau, Oreland, both of Pa., assignors to Captain International Industries, Inc., Montgomeryville, Pa.

Filed June 11, 1975, Ser. No. 586,102

Int. Cl.² B65G *1/12*

U.S. Cl. 221—7 **13 Claims**

1. Article dispensing apparatus comprising:

a. A housing, a rotatable article support in said housing, means supported by said housing for rotating said support, said support having a plurality of compartments, each compartment being open on the periphery of the support,

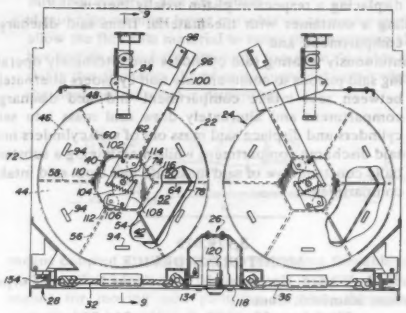
b. A movable door on said housing opposite the open side of one of said compartments,

c. An interlock supported by said housing for latching said article support in a dispensing position wherein one of said compartments has its open side opposite said door,

d. A lock means supported by said housing for locking said door in a closed position,

e. A detent means supported by said housing, said detent means being coupled to said lock means and said interlock for causing said lock means to block any opening

movement of said door unless said article support is in a dispensing position so it can be latched by said interlock, said detent means being responsive to rotation of said article support and during such rotation prevents opening of said lock means, and



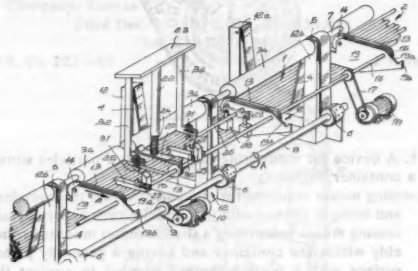
f. means to open said lock means and for causing said interlock to latch said article support in a dispensing position while opening said door.

3,979,018

APPARATUS FOR SEPARATING BUNDLED BARS

Guido Modiano, Via Gallignani, 9, Faenza (Ravenna), Italy

Filed June 3, 1975, Ser. No. 583,355
Claims priority, application Italy, June 5, 1974, 3409/74
Int. Cl.² G07F *11/00*
U.S. Cl. 221—10 **2 Claims**



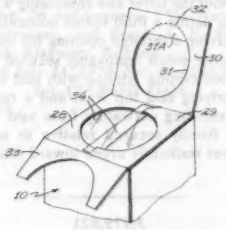
1. Apparatus for separating bundled bars, characterized in that it comprises a magazine for longitudinally containing a bundle of bars and cooperating with means for reducing the transversal width thereof in order to cause the overflowing of a few bars from a longitudinal side thereof; a device for the alternate transfer of the overflown bars, in a perpendicular direction thereto; an elastic pressing element, extending longitudinally parallel to the direction of displacement of the bars under the action of said device and facing this latter at its axis, which at its minimum distance from said device forms therewith a passage in which the bars may be held only side by side; a device for sensing the presence of bars on the transfer device, a sensing device which controls said reduction means by way of activating it and causing the bars to overflow till depletion thereof on said device, instead, of returning them to their rest position on arrival of the bars on the transfer device and which also controls a programmer for the alternating advance and return strokes of the transfer device by imparting to the programmer the starting signal at each overflow of the bars and that for returning to the initial conditions at each mentioned depletion; a device for intercepting the bars, arranged contiguous to said passage and close to its end, which on the arrival of the bar, controls the stopping of the advancement of the transfer device while preparing for the return stroke with the consequent backing of the bars; hooking means, placed in relation to said intercepting device and operating in combination therewith at least after a fixed number of said alternating strokes, for engaging the first bar sent by the transfer device and then withholding it during the subsequent return stroke of said same device, from the separation of this bar from the remaining ones on the transfer device, while alternately the same hooking means, during the new advance stroke of the transfer device, release the bar by its action so that subsequently it reaches a withdrawal station for entry into a bar pushing device.

3,979,019

DISPENSING CLOSURE FOR TISSUE CARTON

Robert A. Bliss, St. Paul, Minn., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

Filed Aug. 7, 1975, Ser. No. 602,789
Int. Cl.² B65H *1/04*
U.S. Cl. 221—48 **6 Claims**



1. A dispensing carton for tissues made from foldable sheet material having four side walls connected in rectangular tube-like configuration, means closing the bottom end of the box, and a stack of interleaved tissues disposed therein, said carton having a top dispensing closure comprising:

a pair of first folded flaps, one of said first folded flaps being hingedly connected along the top edges of each of two opposing side walls, said first folded flaps extending substantially one half the distance across the end of said carton and positioned in substantially abutting relationship with one another;

each of said first folded flaps having a die cut area removed therefrom creating a cooperating aperture for purposes of withdrawing said tissues from said carton;

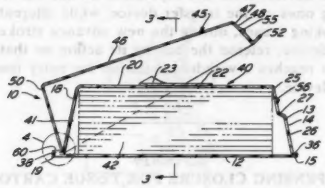
each of said first folded flaps having adhesively attached thereto and covering at least said removed area a piece of flexible film, each of said strips having an inside edge positioned at approximately the midpoint of said carton;

a cover flap formed in size substantially equal to the end of said carton and hingedly attached to one of the remaining two side walls and foldable downwardly into overlapping relationship with said first folded flaps, said cover flap having an aperture formed therein and adapted to lie in juxtaposition with the opening created by the two abutting die cut areas in said first folded flaps and covered by said film strips.

3,979,020
ARTICLE DISPENSING CONTAINER

Robert J. Braber, P.O. Box 568, and Paul L. Weber, 50 Connecticut Drive, both of Burlington, N.J. 08016

Continuation of Ser. No. 420,605, Nov. 30, 1973, abandoned.
This application July 21, 1975, Ser. No. 597,370
Int. Cl.² B65H 1/00
U.S. Cl. 221—63 7 Claims

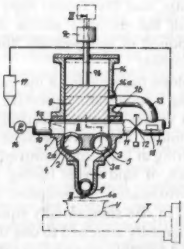


1. A fluid sealed dispensing container fabricated entirely of thermoplastic sheet material and comprising a generally flat bottom wall, a separate upstanding peripheral side wall upstanding entirely about the periphery of said bottom wall spaced inwardly from the circumference thereof, an outstanding circumferential flange extending entirely about said side wall integral therewith and sealed thereabout in fluid-tight downwardly facing relation to the circumferential margin of said bottom wall, a generally flat top wall spaced over said bottom wall and integral with the upper extremity of said side wall entirely about the latter and combining with said side and bottom walls to define a fluid sealed contents holding space, said top wall having a through opening for outwardly passing contents, a closure patch removably secured to said top wall in moisture-proof closing relation with said opening, a separate cover overlying said top wall, and a resiliently flexible hinge flange extending outwardly from said cover integrally therewith and fixedly secured relative to said top wall to mount said cover resiliently urged toward said overlying relation.

3,979,021
SYSTEM FOR DOSING A VISCOUS HARDENABLE MASS INTO A SUCCESSION OF CONTAINERS

Günter Reinecke, Wuppertal-Elberfeld, Germany, assignor to Benz & Hilgers GmbH, Dusseldorf, Germany

Filed Mar. 27, 1975, Ser. No. 562,870
Claims priority, application Germany, Mar. 29, 1974, 2415237
Int. Cl.² B67D 5/52
U.S. Cl. 222—1 8 Claims



8. A method of filling containers with a viscous mass, comprising the steps of:

feeding said viscous mass from an intake compartment into a rotating cylinder having an aperture registrable with said intake compartment by displacing a piston axially in said cylinder to accommodate the mass therein;

simultaneously and synchronously rotating another cylinder previously filled with said mass to communicate the same with a discharge compartment, and driving the mass out of said other cylinder into said discharge compartment by displacing a respective piston axially therein;

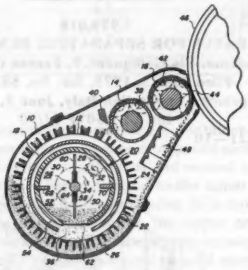
filling a container with the material from said discharge compartment; and

continuously rotating said cylinders and alternately operating said pistons to communicate said cylinders alternately between said intake compartment and said discharge compartment and alternately draw said mass into said cylinders and displace said mass out of said cylinders into said discharge compartment while maintaining a substantially constant flow of said mass into and from said intake compartment.

3,979,022
MONITORING DEVICE

Charles A. Whited, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 28, 1972, Ser. No. 266,936
Int. Cl.² B67D 1/08
U.S. Cl. 222—23 2 Claims



1. A device for monitoring the quantity of particles stored in a container, including;

sensing means mounted for movement within the container and being in contact with the particles stored therein, said sensing means comprising a shaft member mounted rotatably within the container and having a generally planar surface with a portion thereof adapted to contact the particles stored in the container;

first magnetic means mounted on said shaft member in the region of the end portion thereof opposed from the planar surface in a spaced relationship with the particles stored in the container; and

second magnetic means mounted on said container substantially aligned with said first magnetic means and radially spaced therefrom, said second magnetic means cooperating with said first magnetic means to exert a torque on said shaft member for rotating said shaft member from the first position to the second position when the quantity of particles stored in the container is beneath the predetermined level.

3,979,023
DISPENSER FOR FLOWABLE MATERIAL

Ezra Dale Hartley, 2700 Jalmia Drive, Los Angeles, Calif. 90046

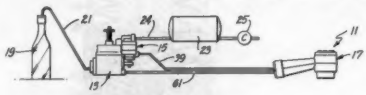
Filed Sept. 5, 1975, Ser. No. 610,746
Int. Cl.² B67D 5/14
U.S. Cl. 222—61 16 Claims

1. A dispenser for flowable material comprising:

a housing having a cavity therein;

a pumping member at least partially in said cavity, said pumping member and said housing at least partially defining a dispensing chamber, said dispensing chamber having an inlet adapted to communicate with a supply of the flowable material and an outlet;

said pumping member being movable on an intake stroke to allow the flowable material to enter the dispensing chamber and on a discharge stroke to force the flowable material in the discharge chamber through said outlet whereby the flowable material is dispensed;



means coupled to said outlet for dispensing flowable material received from said outlet;

means for moving said pumping member through said strokes;

manually operable means for actuating said moving means; and

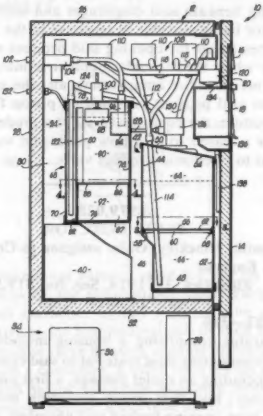
first means responsive to the pressure in the pumping chamber as said pumping member moves on said intake stroke thereof for preventing interruption of said intake stroke by operation of said manually operatable means.

3,979,024

INGREDIENT TEMPERATURE STABILIZATION APPARATUS FOR POST-MIX BEVERAGE DISPENSING MACHINES

William C. Hoppe, Kansas City, Mo., assignor to The Vendo Company, Kansas City, Mo.

Filed Dec. 27, 1974, Ser. No. 536,821
Int. Cl.² B67D *5/62*
U.S. Cl. 222—67 **2 Claims**



1. In a post-mix beverage dispensing machine:

a cabinet having a chamber therein;

means for refrigerating said chamber;

means within said chamber for utilizing a liquid ingredient in preparing a beverage to be dispensed;

an ingredient container within said chamber;

generally horizontally extending partition means within said container dividing the interior of said container into separated upper and lower zones, said partition means being provided with an opening placing the bottom of said upper zone in restricted liquid communication with the top of said lower zone;

means for permitting introduction from time to time of supply-replenishing quantities of a liquid beverage ingredient at substantially ambient temperature into said upper zone of said container, said introduction means including an open-top overflow cup within said upper zone of said container adjacent the top thereof, into which cup said quantities of said ingredient may be initially introduced for relatively gentle overflow therefrom into the remainder of said upper zone for minimizing agitation in connection with intermixing of said newly introduced quantities with quantities of cooler ingredient already within said upper zone;

means coupled with said ingredient utilization means and communicating with said lower zone adjacent the bottom thereof for removing from said lower zone amounts of said ingredient as required for the preparation of beverages to be dispensed,

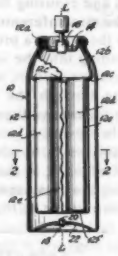
whereby said quantities of said ingredient initially introduced into said cup at ambient temperature are gently delivered to said container and are cooled during storage and migration thereof from said upper zone to said lower zone as said amounts of already cooled ingredient are removed as required from said lower zone.

3,979,025

DEVICES FOR HOLDING AND DISCHARGING LIQUID AND PASTE-LIKE SUBSTANCES UNDER PRESSURE

Richard Friedrich, 26 Auf Loebern, 7701 Walschingen Kreis, Constance, Germany, and Frank A. E. Rindelaub, Ave. Marechal Foch, Rixensart, Belgium

Filed July 24, 1975, Ser. No. 598,785
Int. Cl.² B65D *35/28*
U.S. Cl. 222—95 **28 Claims**

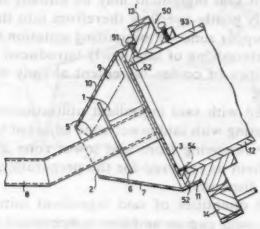


1. In a dual-chamber pressurized dispenser comprising an outer container having an opening; an inner container disposed within said outer container and having an opening; a retaining member connecting said outer and inner containers at their respective openings; a dispensing valve secured in the opening of said inner container by said retaining member; and a predetermined quantity of pressurizing propellant between said inner and outer containers, the improvement comprising: a plurality of hollow, product-containing longitudinal stiffening rib means formed in said inner container and operative to prevent the formation of pockets of entrapped product during the collapsing of said inner container radially inwardly toward its longitudinal axis.

3,979,026
APPARATUS FOR DISPENSING PARTICULATE AND VISCOUS LIQUID MATERIAL

Roger Howard Lee, 69 Bramstead Ave., Compton Ridge, Wolverhampton WV6 8AT, England

Filed Sept. 16, 1974, Ser. No. 506,161
Int. Cl.² B67D 5/64
U.S. Cl. 222—167 **2 Claims**



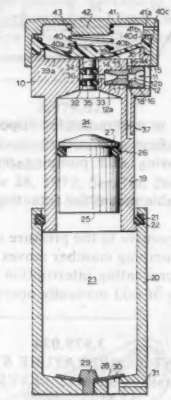
1. An apparatus for dispensing a particulate material comprising a container section for holding the material to be dispensed, and a frustoconical chamber section, said frustoconical chamber section having a narrow end portion which serves as an outlet for the material and a wide end portion, a circular end plate adapted to substantially cover the wide end portion of the frustoconical chamber section and to separate said chamber section from the container section, said circular end plate defining a circumferential inlet which enables the material to pass from the container section into the frustoconical chamber section, said frustoconical chamber section and container section being mounted for axial rotation with their axis at such an angle to the horizontal that the portion of the frustoconical wall which at any instant is lowermost is either horizontal or slopes upwards at a small angle from the circumferential inlet towards the outlet, said circular end plate being fixed so that it does not rotate with the frustoconical chamber and container sections, thereby acting as an agitator for the particulate material and ensuring that the material flows continuously through the circumferential inlet to replace material discharged through the outlet, a probe means attached to the end plate and extending into the inlet between the chamber section and the container section, said probe means agitating the material passing through the inlet, thereby preventing clogging, fixed scouring means disposed within the frustoconical chamber and in operative engagement with the sides thereof for wiping the inside of said chamber as it rotates to loosen any material adhering to the chamber wall and means provided for rotating the frustoconical chamber section and the container section relative to the circular end plate.

3,979,027
PRODUCT PRESSURIZED COMPRESSED AIR DISPENSER HAVING IMPROVED PRODUCT CONTROL VALVE ACTUATOR

Herbert H. Loeffler, Arlington, Mass., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 520,946, Nov. 4, 1974, Pat. No. 3,910,465. This application Sept. 19, 1975, Ser. No. 615,087
Int. Cl.² B67D 5/54
U.S. Cl. 222—193 **4 Claims**

1. In a dispenser for dispensing a fine spray by means of compressed air and having a body having a dispensing nozzle means therein for mixing and dispensing a fluent product and compressed air, a piston-cylinder means depending from said body and having a fixed member in said body and a movable member movable relative to said fixed member for compressing air therebetween, said fixed member having a fluent product containing recess therein opening toward said movable member, a product pressurizing piston in said product containing recess having an end exposed toward said movable member, said body having a product flow path therethrough from said product containing recess to said nozzle means and a product control valve means in said product flow path for controlling flow of product therethrough, and said body further having a compressed air flow path therethrough to said nozzle means and compressed air valve means in said compressed air flow path which is opened near the end of the movement of said movable means for releasing compressed air at a predetermined pressure into said compressed air flow path, the improvement comprising:



a product valve actuator having an actuator element coupled to said product valve, a flexible diaphragm extending outwardly from said actuator element and sealing means on the periphery of said diaphragm fixed in sealing engagement to said body, said compressed air flow path opening beneath said diaphragm and said product valve actuator being movable in response to the pressure of the compressed air for opening said product valve,

whereby when the movable member is moved toward the fixed member for compressing air, the compressed air acts on said product pressurizing piston for pressurizing the product, the compressed air at a predetermined pressure is released to said flow path, said valve actuator is moved to open said product valve.

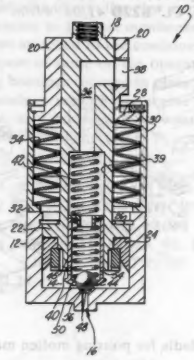
3,979,028
FLUID INJECTOR

Paul H. Smith, Hinckley, Ohio, assignor to Colorflo Limited, Hitchin, England

Filed Oct. 31, 1974, Ser. No. 519,513
Int. Cl.² B41F 31/08
U.S. Cl. 222—380 **8 Claims**

1. Apparatus comprising a housing including a chamber, means for conducting fluid material to said chamber, said fluid chamber including an outlet passage, a first piston movable in said chamber, said first piston including means defining a bore, said bore opening toward said chamber, a second piston slidable in said bore, self-sealing valve means carried by said second piston, spring means operative to urge said second piston toward a closed position in which it closes said outlet passage against fluid flow therethrough, means for moving said first piston to a position in which it is operative to apply pressure to the fluid in said chamber, surface means on said second piston and oriented such that the fluid in said chamber operates against said surface and tends, upon pressurization of said fluid, to urge said second piston away from said closed position, and a flange carried by said second piston around the periphery of said second piston having an outer dimension

greater than the inner dimension of said bore and operative upon movement of said second piston away from said closed position to act as a sealing means to block fluid flow from said chamber through the spaces between said piston and said bore and to act as a stop means to engage a portion of said first



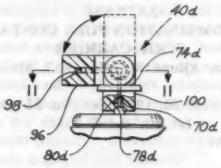
piston which defines said bore, said flange having an effective surface area acted on by the fluid in said chamber upon pressurization of said fluid which is sufficiently less than the effective surface area of said surface means in order to cause said second piston to move away from said closed position.

3,979,029

MULTI-DIRECTIONAL AEROSOL VALVE FOR USE ON AN AEROSOL CONTAINER

R. W. Hodgson, 1680 N. Vine St., Hollywood, Calif. 90028, and Steve A. Rands, 4353 E. Floral Drive, Los Angeles, Calif. 90022

Filed Dec. 16, 1974, Ser. No. 532,998
Int. Cl.² B05B *1/16*
U.S. Cl. 222—402.17 **8 Claims**



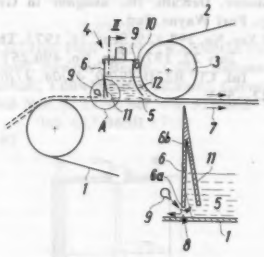
1. A multi-directional aerosol valve for use on an aerosol container to provide for substantially completely emptying such an aerosol container in any selected one of multiple directions relative to the longitudinal axis of such a container, comprising: a hollow valve housing capable of being affixed to a top wall of such a container; a valve body within said hollow valve housing and having a dip tube attaching means adjacent to a bottom portion thereof; a dip tube affixed to said attaching means; a hollow, longitudinally movable valve stem having passage means therein for dispensing pressurized liquid material from within such a container, said stem having a closed end which reciprocates within said hollow valve body and having cap-attaching means on its other end, said other end protruding upwardly through said hollow valve housing; valve sealing gasketing means for said passage means; valve stem biasing means cooperable for biasing said valve stem so that said passage means of said valve stem is biased against said sealing means to maintain said valve stem and passage means in a normally sealed, closed condition biased into a maximum extension position; and stem-covering valve cap means having controllably selectively operable, differently directible spray-discharging orifice means; said differently directible spray-discharging orifice means of said valve cap means being provided with controllably operable and movable selector means for selecting multiple different spray-discharging directions for said orifice means including at least one substantially laterally facing direction and at least one substantially upwardly facing direction and with said controllably operable and movable selector means also effectively functioning as activation and inactivation means for controllably inactivating the non-selected ones of said multiple different spray-discharging directions of said orifice means other than the selected spray-discharging direction selected by said controllably operable and movable selector means which is effectively activated thereby, said selector means comprising a common rotary sleeve member carried by and comprising a portion of said cap means for rotary displacement between a first lateral discharge selector position and a second vertical discharge selector position.

3,979,030

APPARATUS FOR DISPENSING POURABLE SUBSTANCES UNIFORMLY ONTO BELTS HAVING HIGHLY SENSITIVE SURFACES

Karl Gunnar Boman, Neckarrems, Germany, assignor to Sandco Ltd., Canada

Filed Oct. 9, 1973, Ser. No. 404,386
Claims priority, application Germany, Oct. 11, 1972, 2249632
Int. Cl.² B60P *1/38*
U.S. Cl. 222—415 **51 Claims**



1. An apparatus for dispensing viscous, pourable substances uniformly onto belts having highly sensitive surfaces, especially for dispensing a uniform layer of polymer resins onto a steel belt, comprising a storage box which is open at the bottom and consists only of side walls which are located directly adjacent to the surface of the belt and in which at least the bottom edge of the end wall located at right angles to the direction of travel of the belt is arranged just above the surface of the belt and sealed by means of a flow of gas or liquid directed at the gap between the bottom edge and the surface of the belt from the outside.

3,979,031

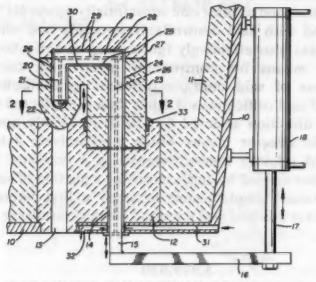
DISCHARGE VALVE ASSEMBLY FOR A METAL LADLE ACTUATED THROUGH BOTTOM OF LADLE

John A. Ericson, 732 Market St., Youngstown, Ohio 44502

Filed May 5, 1975, Ser. No. 574,565
Int. Cl.² B22D *35/06, 41/10*
U.S. Cl. 222—592 **5 Claims**

1. In a ladle for molten metal having a bottom wall and means in the bottom wall providing a discharge opening and a separate passageway therethrough, a valve assembly for said discharge opening and consisting of a stopper in said ladle and means positioning said stopper for vertical movement toward and away from said discharge opening, said means including a vertical portion extending through said passageway and

having a sideward extension carrying said stopper in depending relation thereto and means exteriorly of said ladle for moving said vertical portion of the means positioning said



stopper and a sleeve disposed in said separate passageway for sliding sealing engagement with said vertical portion of the means positioning said stopper.

3,979,032

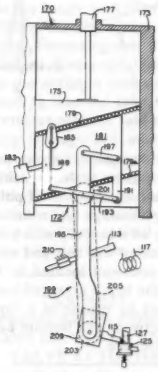
METAL MELTING AND CASTING APPARATUS

Jesse A. Stoner, DeKalb, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 397,425, Sept. 14, 1973. This application July 22, 1974, Ser. No. 490,257

Int. Cl.[2] B22D *39/00, 41/04, 41/06*

U.S. Cl. 222—593 **38 Claims**



33. Apparatus for casting a metal comprising means for casting the metal melted therein, means for receiving a predetermined amount of the metal in its solid state and generally constituted by a tube into which the metal is inserted, a slot in said tube for the passage therethrough of the metal into said casting means, means operable generally for depositing the metal into said casting means through said slot from said tube, and means for moving said casting means to a metal casting position when the metal therein is melted.

3,979,033

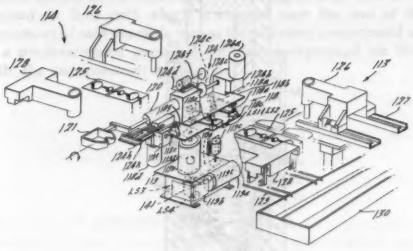
AUTOMATIC PISTON POURING EQUIPMENT

Robert J. Fulton, Mississauga; Neil S. Calvert, Toronto, and Joseph W. Valler, Downsview, all of Canada, assignors to Chrysler Corporation, Highland Park, Mich.

Filed Sept. 29, 1972, Ser. No. 293,712

Int. Cl.[2] B22D *41/04, 41/06*

U.S. Cl. 222—604 **14 Claims**



1. An automatic ladle for pouring molten material comprising:

a pouring ladle,

a substantially horizontal arm supporting the ladle at one end thereof for rotational movement between a substantially horizontal normal attitude for filling the ladle and a tilted attitude for pouring the metal from the ladle when the arm is rotated about its longitudinal axis, and

rotating means operatively connected to the arm for rotating it about its longitudinal axis in a controlled manner whereby pouring from the ladle is accomplished, the rotating means including:

variable speed electric motor means operatively connected to the arm for rotating it, and

electrical control means responsive to ladle-arm rotation and operatively connected to the motor means for controlling the speed of rotation thereof to provide pouring of the metal therefrom a variable controlled pour rates during pouring.

3,979,034

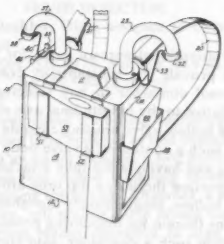
LOGGER'S COMBINATION FUEL CONTAINER AND TOOL CARRIER

Henry J. Larman, Ajlune Rte. Box 102, Mossyrock, Wash. 98564

Filed Feb. 20, 1975, Ser. No. 551,306

Int. Cl.[2] A45F *3/04*

U.S. Cl. 224—5 W **3 Claims**



1. A combination fluid container and tool carrier transportable on the back of a chain saw operator, the invention comprising,

a fluid container partitioned to define at least two fluid storage chambers, said container having front and rear walls with intermediate side walls,

flexible spout arrangements serving each of said chambers, said spout arrangements including a cap closure to prevent spillage,

a vent line terminating adjacent the spout end and oppositely in communication with a buoyant vent block within one of said chambers thereby communicating atmospheric pressure to the last mentioned chamber interior,

shoulder straps attached to the container permitting convenient transport of same on the operator's back, and

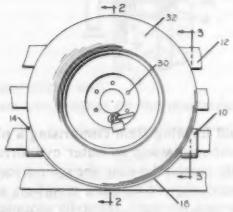
tool receiving housings secured in place on at least one wall of said container serving to receive chain saw maintenance tools, said housings of a weatherproof nature to protect tools housed therein.

3,979,035

TIRE CARRIER FOR STOCK RACKS

Tommy J. Huot, Rte. 1, Linn, Mo. 65051

Filed June 10, 1975, Ser. No. 585,662
Int. Cl.² B62D *43/00*
U.S. Cl. 224—42.24 **3 Claims**



1. A spare tire carrier for truck racks having parallel slats, said carrier comprising an arcuate tire support, said support being comprised of a metal frame having at an upper portion a pair of horizontally spaced inverted U-shaped hook members adapted to be removably fitted over a rack slot and a lower portion of the tire support comprising an arcuate rim like member supporting a tire thereon and securing means for securing said tire against the rack, said securing means comprising a hook adapted to fit over a rack slat and an adjustable chain connecting said slat hook to a second hook member having a threaded end fitting through a bolt opening in the spare tire wheel and a nut-like member threadably engageable with the threaded end of the hook adapted to be adjusted thereon to draw the spare tire tightly against the rack, whereby when the spare tire is resting on the arcuate tire support movement thereof is prevented when the securement means is properly engaged and secured.

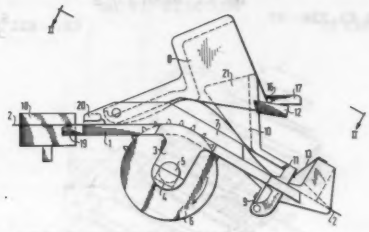
3,979,036

PAPER GUIDE FOR TAPE PERFORATORS WITH AN AUTOMATIC PITCH-ADAPTED THREADING MECHANISM FOR THE FEED ELEMENT ZONE

Guenther Vorbach, Schwindega, and Wolfgang Peter Mueller, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 29, 1975, Ser. No. 608,891
Claims priority, application Germany, Sept. 20, 1974, 2445060
Int. Cl.² G03B *1/24;* **B65H** *25/00*
U.S. Cl. 226—83 **11 Claims**

1. A mechanism for automatic pitch-adapted threading and guiding of data carriers adjacent the feed and scanner elements of perforating punches comprising: a guide track having interlocking retainers pivotably connected thereto including a pivoting component and a locking component, the guide track having fixed flange means formed therewith, a shaft of a rotatable feed element received in said flange means whereby the feed element is carried by said guide track, the retainers pivotable through an arc, an electrical sensing device associated with said guide track, a portion of at least one of said retainers contacting the electrical sensing device during movement through its arc to actuate the sensing device, the sensing device operatively coupled with the feed element whereby actuation of the sensing device causes rotation of the feed



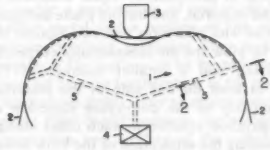
element, and at least one of the retainers positioned with respect to the feed element to urge a data carrier positioned on the guide track above the feed element into contact with the feed element during pivoting of the at least one of the retainers to a closed, electrical sensing device actuating position.

3,979,037

AIR GUIDE FOR TAPE TRANSPORTS

Donald L. Burdorf, Newport Beach, Calif., assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 7, 1974, Ser. No. 521,882
Int. Cl.² B65H *17/32*
U.S. Cl. 226—97 **4 Claims**



1. An air guide apparatus adapted to guide a span of recording tape as it is transported past a head, said apparatus comprising:

a concave guide surface;

a pair of flanges spaced apart a distance slightly greater than the width of the recording tape and located on opposite sides of the path to be followed by said tape along said guide surface;

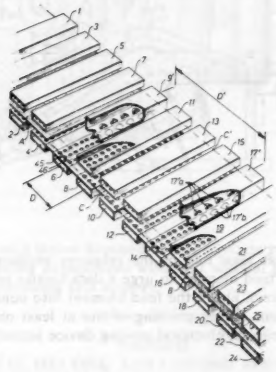
at least one air port, having a means for providing air under pressure connected thereto, located in said guide surface substantially at the point where a pressurized air film is sought to be initiated;

said guide surface being located adjacent to said head whereby, as said tape travels along and is guided by said guide surface and between said flanges, a film of pressurized air is generated between said guide surface and tape in the direction of tape travel along said guide surface which effectuates a reduction in sliding friction therebetween and maintains a substantially linear profile of said tape across its width as it is transported past said head.

3,979,038
ARRANGEMENT AT TRANSPORT OF WEB OR SHEET MATERIAL

Ingemar Karlsson, Vaxjo, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed May 28, 1975, Ser. No. 581,668
Claims priority, application Sweden, May 29, 1974, 7407118
Int. Cl.² B65H 17/32
U.S. Cl. 226—97 **5 Claims**



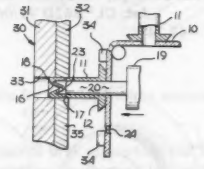
1. An apparatus for the transport of web or sheet material carried on air to advance the material in a fixed stable floating position without flutter in a conveying path through one or more decks of a treating plant having air supply means comprising a plurality of blow boxes distributed along the conveying path of the material and provided with apertures for air outflow against the material, and air exhaust means comprising a plurality of exhaust spaces provided adjacent the blow boxes, which blow boxes are mounted in spaced parallel relation with each other and perpendicularly to the conveying direction of the material on both sides of the plane surfaces of the material at substantially equal distances from the plane through the material, and having plane surfaces facing toward the material with apertures directed against the material and designed to blow the air substantially perpendicularly against the material, and a smaller number of fixing chambers mounted at least on one side of the material and disposed perpendicularly to the conveying direction of the material with a separation relative to each other along the conveying path exceeding the separation of the blow boxes, which chambers are provided with air outflow apertures directed against the plane of the material to bring about an air flow in parallel with the plane of both the material and the fixing chamber, characterized in that the fixing chambers are mounted at a smaller distance from the conveying path than the blow boxes and are provided with outflow apertures directed obliquely to the plane of the conveying path, and that at least one blow box with apertures distributed over its plane is mounted directly in front of a fixing chamber, and that exhaust spaces adjacent said one blow box are entirely or partially closed.

3,979,039
BLIND RIVET APPARATUS

Melvin J. David, 16221 Quemada Rd., Encino, Calif. 91316

Division of Ser. No. 307,442, Nov. 17, 1972, abandoned. This application June 21, 1974, Ser. No. 481,502
Int. Cl.² B21J 15/36
U.S. Cl. 227—60 **6 Claims**

1. A blind rivet and insertion tool for use with a blind rivet assembly which has a preformed rivet head having top and bottom surfaces, a cylindrical member having a uniform inner and outer diameter integral with and depending from said preformed rivet head, said preformed rivet head having an aperture therethrough coextensive with the inner diameter of said cylindrical member, a rivet head forming end integral with said bylindrical member and in axial opposition to said preformed rivet head, said preformed rivet head comprising first and second portions, the diameter of said first portion being reduced along the axis thereof, said first portion depending into said second portion, said second portion having a continually increasing diameter along the axis thereof, the maximum diameter of the second portion being substantially equal to that of said cylindrical member, said insertion tool comprising means for forming said rivet forming end into a blind rivet including a base member of substantially the same shape as said preformed rivet head and a forming stem coupled to said base, said forming stem comprising a plurality of aligned forming members having an outer cylindrical profile adapted to be slidably received within the cylindrical member of said blind rivet, said aligned forming members each comprising first and second sections pivotally coupled to one another and having an inner cylindrical aperture along the axis thereof, said cylindrical aperture extending outwardly into a symmetrical cavity uniformly disposed into the inner surfaces of said aligned forming members, said forming stem including means for imposing an outwardly directed radial force on said forming stem, said means being slidably disposed within said forming stem whereby a radial force is imposed on said second portion when said means is withdrawn from said forming stem, the symmetrical cavity disposed into the inner surfaces of said aligned forming members being adapted to receive said means therein.



3,979,040
NAIL DRIVER

Adam Denin, P.O. Box 10021, Amarillo, Tex. 79106

Filed Sept. 22, 1975, Ser. No. 615,798
Int. Cl.² B25C 5/06
U.S. Cl. 227—113 **7 Claims**

1. A magnetic nail driver comprising:
a. a cylindrical tube made of nonmagnetic material having a handle end and a magnetic end,
b. a rod-shaped driver telescoped within the tube,
c. a weighted handle on the driver, the handle extending from the handle end of the tube,
d. a tubular magnetic holder over the tube at the magnetic end forming
e. an annular space between the magnet holder and tube, and
f. a plurality of permanent bar magnets in the magnet holder,
g. all said magnets aligned with the tube and oriented in the same direction.

7. A magnetic nail driver comprising:
a. a cylindrical tube made of nonmagnetic material having a handle end and a magnetic end,
b. a rod-shaped driver telescoped within the tube,
c. a weighted handle on the driver, the handle extending from the handle end of the tube,
d. said handle of magnetic material and having a shoulder

adjacent the rod-shaped driver so the tube may be reversed and held together magnetically for storage and

transportation, and

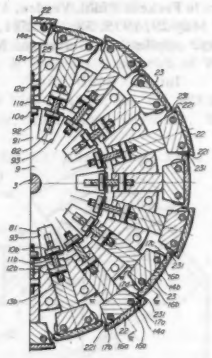
e. at least one magnet on the magnetic end of the tube.

3,979,041

CLAMPING MECHANISM FOR LINE-UP OF PIPES

Kiyoshi Kaneyama; Masashi Nakamura, and Takanobu Murakami, all of Kanagawa, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 11, 1975, Ser. No. 549,003
Claims priority, application Japan, July 13, 1974, 49-79743
Int. Cl.² B23K *31/02*
U.S. Cl. 228—49 5 Claims



1. An apparatus for aligning, expanding and welding pipes, comprising

a pair of cylindrical housings;

a first assembly in one of said housings, comprising a plurality of first members extending in a radial direction, metal backing means affixed to each of said first members, roller means on each of said first members, and means for moving alternate ones of said first members in radial direction;

a second assembly in the other of said housings, comprising a plurality of second members extending in a radial direction and means for moving all of said second members together in said radial direction; and

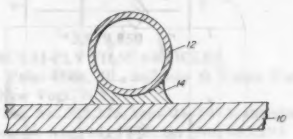
driving means, including hydraulic means, for driving said first and second members.

3,979,042

VACUUM BRAZING OF NICKEL TO ALUMINUM

Bruce J. Peters, Hanover, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jan. 16, 1975, Ser. No. 541,534
Int. Cl.² B23K *1/04*
U.S. Cl. 228—183 15 Claims



1. The method comprising the steps of:

providing members or predominantly nickel and aluminum or alloy of aluminum;

assembling said members in a preferred configuration;

providing a brazing material at junctures between said members, said brazing material comprising aluminum, silicon, and magnesium;

providing a non-reactive atmosphere around the assembled members; and

heating said members until a braze forms therebetween.

3,979,043

ALUMINUM BRAZING METHOD

Calvin C. Lowery, Huntington Woods, Mich., assignor to Wall Colmonoy Corporation, Detroit, Mich.

Filed Oct. 17, 1975, Ser. No. 623,437
Int. Cl.² B23K *1/04*, *1/20*
U.S. Cl. 228—205 8 Claims

1. A method of brazing members composed of aluminum and alloys of aluminum which comprises the steps of applying a substantially uniform coating of metallic manganese to at least one of the surfaces of the members to be joined in an amount sufficient to react with the aluminum oxide film on said surfaces to enable a penetration of said oxide film by a molten brazing filler metal and a wetting of the underlying base metal substrate, applying a brazing filler metal to the member in the region of the surfaces to be brazed, heating the member to an elevated brazing temperature in the presence of a vacuum of at least about 0.001 Torr to effect a melting and flow of said brazing filler metal between the surfaces to be joined and a penetration and wetting of the substrate base metal beneath the oxide film, and thereafter cooling and extracting the brazed said member.

3,979,044

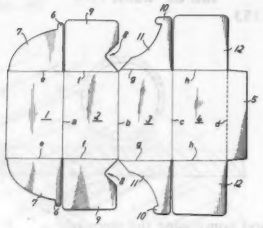
CARTON CONSTRUCTION

Masuzo Tani, No. 19-9, 2-chome, Minami Umagome, Ota, Tokyo, Japan

Filed Apr. 17, 1975, Ser. No. 568,821
Claims priority, application Japan, Jan. 13, 1975, 50-6147
Int. Cl.² B65D *5/72*, *5/54*
U.S. Cl. 229—17 R 3 Claims

1. A carton construction comprising a first side panel, supporting flaps hingedly connected to said first side panel at each end thereof, said supporting flaps having a fan-shaped convex edge and a projection located adjacent the convex edge outermost from the hinged connection, a second side panel hingedly connected to said first side panel, lower cover flaps hingedly connected to said second side panel at each end thereof, said lower cover flaps having substantially rectangular edges and having a V-shaped cutout at one edge, said V-shaped cutout located adjacent the hinged connection be-

tween said second side panel and said lower cover flap, a third side panel hingedly connected to said second side panel, locking flaps hingedly connected to said third side panel at each end thereof, wherein the distance between the ends of said second side panel is less than the distance between the ends of said third side panel, said locking flaps having an angle portion at an edge opposite from the V-shaped cutout of said



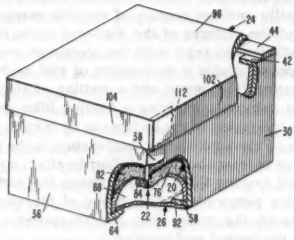
lower cover flaps, a concave portion extending from said angle portion, and a projection extending from said angle portion, a fourth side panel hingedly connected to said third side panel, upper cover flaps hingedly connected to said fourth side panel at each end thereof, said upper cover flaps having substantially rectangular edges, and a connecting panel hingedly connected to said fourth side panel.

3,979,045

BULK MATERIAL CONTAINER

Robert A. Bamburg; Farris N. Duncan, both of West Monroe, and Roger M. Floyd, Monroe, all of La., assignors to Olinkraft, Inc., West Monroe, La.

Filed Aug. 28, 1975, Ser. No. 608,799
Int. Cl.² B65D *13/04*
U.S. Cl. 229—23 R **7 Claims**



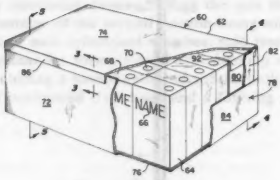
1. A bulk material container comprising
an integral body having side panels for forming an enclosed wall and having short flaps hinged on the edges of the side panels at one of the top and bottom ends of the body,
a large flap overlapped and secured to one of the short flaps and adapted to be overlapped and secured to the other short flaps to close the one end,
said integral body formed of a paperboard having a first weight,
said large flaps formed of a paperboard having a second weight,
said first weight being substantially greater than said second weight,
means for closing the other of the top and bottom ends of the body, and
said large flap having a fold line adjacent the edge of the one short flap opposite to the hinge on the respective side panel for allowing the large flap to be folded over the one short flap and respective side panel.

3,979,046

SPECIAL SHIPPING CASE HAVING MODIFIED END FLAPS

Charles J. Wilbur, Barrington, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Feb. 27, 1975, Ser. No. 553,565
Int. Cl.² B65D *5/18, 5/36*
U.S. Cl. 229—37 R **14 Claims**



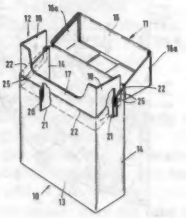
1. A tubular partially assembled blank corrugated shipping case comprising a top panel, side panels, and bottom panel, each of said panels being delineated by respective score lines; respective minor end flaps extending from each end of said side panels and being delineated therefrom by score lines therebetween, major end flaps extending from both ends of said top and bottom panels and being delineated therefrom by respective score lines, said minor and major end flaps being hinged to said respective panels, and being free of direct attachment to adjacent end flaps along the respective edges thereof; separator strips of corrugated material integral with said minor end flaps adjacent the top and middle edges of said minor end flaps; said major end flaps being unattached to said minor end flaps in a cutting zone along the entirety of the adjacent edges of the top panel, said major end flaps being secured to said minor end flaps below said zone.

3,979,047

CIGARETTE PACKETS

Heinz Focke, and Kurt Liedtke, both of Verden, Aller, Germany, assignors to Focke & Pfuhl, Verden, Aller, Germany

Filed May 29, 1975, Ser. No. 581,995
Claims priority, application Germany, May 29, 1974, 2426131
Int. Cl.² B65D *5/34*
U.S. Cl. 229—44 CB **6 Claims**



1. In a blank for forming a hinged lid packet for cigarettes or the like wherein the blank has integral portions which are folded to form the front, back, sides, bottom and hinged lid of the packet, the improvements comprising:
a. a first pair of parallel fold lines defining a first folding strip extending laterally across the portion of the blank which forms the front of the packet; and
b.a second pair of parallel fold lines extending obliquely across the portions of the blank which forms the sides of the packet, one end of the second pair of parallel fold lines coinciding with an end of the first pair of parallel fold lines, said second pair of fold lines defining second folding strips, each of said second folding strips having at

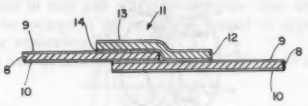
least one relief aperture therethrough the relief apertures allowing the blank to be folded in a Z fold about the parallel fold lines to form an inwardly disposed collar portion, about which the hinged lid fits such that outer surfaces of the hinged lid is flush with the outer surfaces of at least the front and sides of the packet.

3,979,048

PACKAGE COMPRISING A STIFF STRIP

Olof Stark, Rydsgard, and Rolf Dilot, Lund, both of Sweden, assignors to AB Ziristor, Lund, Sweden

Filed Dec. 4, 1974, Ser. No. 529,540
Claims priority, application Sweden, Dec. 5, 1973, 7316394
Int. Cl.² B65D 5/42, 3/00
U.S. Cl. 229—48 T 1 Claim



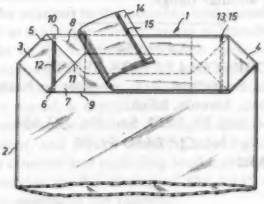
1. In a filled package of the type which is manufactured from a material web of laminated material comprising a base layer of paper or cardboard which is coated at least on the inside with a heat-sealable polyethylene material and which material web is formed into an end closable tube in which the longitudinal edge zones of the web are heat sealed together in overlapping relation, the improvement in which the longitudinal joint on the inside of the package is covered by a strip of a laminated material consisting of a base layer of polyamide having a higher softening temperature than the polyethylene on the inside of the package, both sides of said strip base layer being coated with polyethylene, one side of which is heat sealed to the polyethylene coating on the inside of the package along the longitudinal joint.

3,979,049

CROSS-BOTTOM BAG

Fritz Achelpohl, Lengerich of Westphalia, Germany, assignor to Windmoller & Holscher, Lengerich of Westphalia, Germany

Filed May 8, 1974, Ser. No. 468,168
Claims priority, application Germany, May 10, 1973, 2323726
Int. Cl.² B65D 33/02, 33/22
U.S. Cl. 229—60 2 Claims



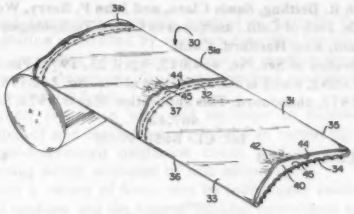
1. A cross-bottom bag comprising, in combination, a pair of oppositely disposed, inwardly folded corner tucks at one end of the bag, a pair of oppositely disposed, inwardly folded side fold portions at said one end of the bag, said side fold portions having diagonal fold edges extending in overlying relationship with said corner tucks, a bottom cover sheet being adhesively secured in overlying relationship with said folded corner tucks and said folded side portions, a strip of adhesive material of the thermoplastic type on each of said corner tucks, each of said strips having end portions extending in underlying relationship with the diagonal fold edges of said folded side portions and across the fold lines of said side fold portions in doubled-back overlying engagement, each of said strips having an intermediate portion between diagonal fold edges in underlying relationship with said bottom cover sheet and a strip of adhesive material of the thermoplastic type adjacent each end of said bottom cover sheet on said one side in overlying aligned sealing engagement with said respective strips of adhesive material on said corner tucks to form a sealed bottom on the bag.

3,979,050

MULTI-PLY FILM ARTICLES

Phillip F. Cilia, Palos Hills, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 399,315, Sept. 21, 1973, abandoned.
This application Aug. 11, 1975, Ser. No. 603,293
Int. Cl.² B65D 33/00
U.S. Cl. 229—66 10 Claims



1. A flat flexible multi-ply plastic film article comprising a first ply of flat flexible plastic film superimposed over a second ply of flat flexible plastic film, having opposite edges thereof joined and an openable end with substantially aligned edges, characterized by a portion of said first ply of film defining the openable end being puckered and non-uniformly distorted, separating a portion of the confronting face of said first ply of film from the opposed confronting face of said second ply of film and displacing a portion of said aligned edge of said first ply of film relative to the opposing aligned edge of said second ply of film, said displaced edge portion of film being contracted and drawn back generally towards a central portion of said article, whereby the distorted portion of film provides means for grasping and readily separating the confronting faces of said first and second plies of film.

3,979,051

MULTI-COMPARTMENT ENVELOPE

Patrick J. Close, Media, Pa., assignor to American Fiber Velope Manufacturing Company, Collingdale, Pa.

Filed June 23, 1975, Ser. No. 589,343
Int. Cl.² B65D 27/08, 85/30
U.S. Cl. 229—72 7 Claims

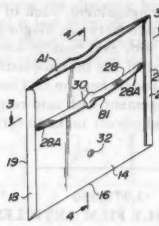
1. A multi-compartment envelope comprising:

a. a first sheet folded along a medial line thereof defining a front and back panel, said front and back panel secured together on opposing lateral edges forming a first vertically accessible pocket opening;

b. a second sheet separate and distinct from said first sheet and having dimensions not exceeding those of said front panel; and,

c. means cementing at least an upper portion of the marginal edges of the second sheet to the interior surface of said front panel, said front panel having a slot formed therethrough being vertically displaced from said first pocket opening, said upper portion marginal edges of said

second sheet being cemented to said interior surface above and contiguous to said slot to enable vertical access



to a second pocket opening between the front panel and the second sheet.

3,979,052

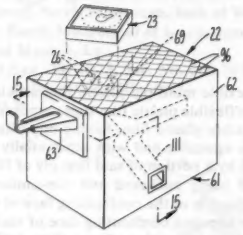
HIGH SECURITY LOCK

Joseph R. Dettling, Santa Clara, and John P. Barry, Woodland Hills, both of Calif., assignors to United Technologies Corporation, East Hartford, Conn.

Division of Ser. No. 464,013, April 25, 1974, Pat. No. 3,873,892, which is a continuation of Ser. No. 248,196, April 27, 1972, abandoned. This application May 6, 1974, Ser. No. 467,420

Int. Cl.² B65D *91/00*

U.S. Cl. 232—43.1 **4 Claims**



1. A keyhole-less, drawerless, coin-collecting security device for a coin-operated machine comprising in combination:

a. a receiver structure formed, at least in part, from a magnetic field permeable material; said structure providing a barrier to physical penetration thereof;

b. a coin slot means on said receiver for introducing coins into said receiver;

c. coin storage means disposed within said receiver in coin receiving relationship to said coin slot means, said storage means being adapted to contain simultaneously a multiplicity of coins and being provided with a hopper-shaped bottom;

d. chute means within said receiver leading from said hopper-shaped bottom to a discharge opening in the exterior of said receiver; said coin slot means and said discharge opening normally constituting the sole means of access from the exterior of said receiver to said coin storage means;

e. valve means, within said receiver movable from a closed position which blocks said chute to an open position which permits coin flow through said chute from said hopper to the exterior of said receiver;

f. magnetic locking means within said receiver, said locking means comprising:

i. magnetic field detecting means for detecting a predetermined externally generated magnetic field pattern; said magnetic field detecting means being located within said receiver and in proximity to said magnetic field permeable portion thereof; and,

ii. actuating means for moving said valve means from said closed position to said open position; said actuating means being responsive to a predetermined magnetic field pattern detected by said magnetic field detecting means.

3,979,053

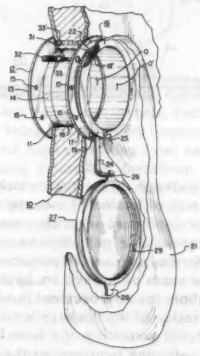
REFUSE DEVICE

Arthur M. Amann, Box 594, Lyman, Wyo. 82937

Filed Dec. 30, 1974, Ser. No. 537,128

Int. Cl.² B65D *91/00*

U.S. Cl. 232—43.2 **1 Claim**



1. A refuse passage device for installation in a pass-through aperture of a structural member, said device including, in combination, ingress and egress flange members, each having an annular, radially outwardly extending flange portion and an inner tubular portion integral with its respective flange portion, said tubular portions being in mutual telescoping cooperation, and said egress flange member also including a refuse-bag-attachment annular outwardly extending flange circumscribing the interior of said tubular portion thereof and spaced outwardly from said egress flange portion, said egress flange member being provided with a recessed surface disposed between said refuse-bag-attachment annular flange and said egress member annular flange portion, and wherein said egress flange member includes flanged cap means secured to and suspended vertically beneath said egress flange member for releasably closing and retentively fitting over said refuse-bag-attachment annular flange.

3,979,054

COIN COLLECTION SYSTEM

Billy J. Graham, Smithfield, Tex., assignor to National Pride Equipment, Inc., Livonia, Mich.

Filed July 27, 1973, Ser. No. 383,086

Int. Cl.² B65D *91/00*

U.S. Cl. 232—43.2 **1 Claim**

1. A system for use in two stalls formed on each side of a separating wall in a coin operated vehicle cleaning facility for receiving coins from both stalls, comprising:

a coin collector safe to be embedded in concrete, said safe having two conduits extending therefrom forming two coin inlets, one for each stall, said safe having a door formed in one end for removing the coins collected,

metal sidewalls for surrounding said safe to define a space around said safe for receiving wet concrete whereby said metal sidewalls form part of the completed structure for holding the concrete which embeds the safe when the wet concrete is inserted into and hardens in the space between said safe and said surrounding walls,

said sidewalls comprising two sections, each section having three sides connected together for surrounding opposite ends of said safe at positions to form a gap between said sections intermediate said opposite ends of said safe to allow said system to be inserted through an opening in the separating wall of the motor vehicle cleaning facility with the edges of said separating wall forming the opening, located in said gap whereby opposite ends of said safe may be located in the two stalls formed on opposite sides of the separating wall,

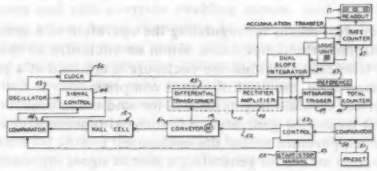
at least one of said sections being connected to said safe.

3,979,055

WEIGHING SYSTEM FOR CONVEYING MEANS

George H. Fathauer, Mesa, Ariz., and Wesley J. Bachman, Auburn, Ill., assignors to A.O. Smith Harvestore, Inc., Arlington Heights, Ill.

Filed May 3, 1974, Ser. No. 466,678
Int. Cl.² G01G *11/14*
U.S. Cl. 235—92 WT **30 Claims**



1. An electronic scale conveyor apparatus having a conveyor element for through flow of material, comprising detection means for generating a rate weight signal proportional to the weight of material delivered per unit of time by said conveyor element, a digital rate counter, a clock source for driving said digital counter, logic circuit means coupled to said detection means and said digital counter to cyclically actuate said counter to detect the weight rate of material conveyed, a counter readout, and readout transfer means for operatively coupling the readout to the counter, said transfer means being connected to said logic circuit means to transfer the output of the counter to the readout with each cycle of said counter, pulse means for generating a pulse train signal having a repetition rate corresponding to a predetermined function of the rate-weight signal, a digital total counter connected to said pulse means to record the total weight delivered by said conveyor element, and means coupling said digital total counter to said rate counter and including total transfer means to force set rate counter to the setting of the total counter and to transfer the output to the readout.

3,979,056

MULTI-PRODUCT COOKING COMPUTER

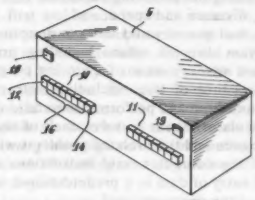
Miles J. Barnes, Woodbridge, Conn., assignor to Food Automation Service Techniques, Inc., Stratford, Conn.

Filed Aug. 25, 1975, Ser. No. 607,189
Int. Cl.² G06M *3/02*; **A47J** *27/62*
U.S. Cl. 235—92 MT **18 Claims**

1. A multi-product cooking computer for timing the cooking of foods immersed in a heated cooking medium, said computer being adapted to compensate for variations in temperature of the medium and in the type of food being cooked, said computer including,

a temperature sensing probe adapted to be positioned in said medium and to produce an electrical signal corresponding to the temperature of said medium,

a plurality of timing circuits, each corresponding to a preselected type of food and producing an electrical signal related to the required amount of cooking for the respective food types,



a signal controlled oscillator adapted to have its rate of oscillation controlled by said two electrical signals, said rate increasing for increasing cooking medium temperatures and decreasing for longer required cooking times for particular foods,

a counter associated with said oscillator to receive the output of said oscillator and produce an output signal at a pre-determined oscillation count, and an operator warning device activated by said output signal,

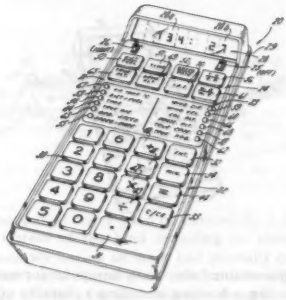
whereby a variety of foods may be individually cooked in said medium and the time of cooking determined by the type food and the temperature of the cooking medium.

3,979,057

ELECTRONIC NAVIGATIONAL COMPUTER

Ronald Katz, Indian Head Park; Aaron Aronson, and Clarence Turek, both of Glenview, all of Ill., assignors to Specialized Electronics Corporation, Chicago, Ill.

Filed Oct. 29, 1974, Ser. No. 518,728
Int. Cl.² G06F *15/50*, *9/18*
U.S. Cl. 235—156 **31 Claims**



1. A self-contained hand-held electronic computer for aircraft navigational problems comprising in combination:

a housing having a storage battery power unit, a visual numerical display, a keyboard, program director means, register means for storage of data including input data and intermediate results, calculator means for performing predetermined computational functions, and interfacing circuit means for operatively connecting said keyboard, said program director means, said register means, said calculator means and said display;

said keyboard comprising a plurality of input data keys including 0 to 9 days and an enter key;

a plurality of program selector keys for at least each of the following navigational and performance problems:

1. effect of winds aloft on aircraft progress and maintenance of course,
2. effect of non-standard atmospheric conditions on aircraft performance, and

a plurality of porgram selector keys for time related problems involving two entry multiplication or division functions relating the following variables:

1. time, distance and speed, and
2. time, fuel quantity and fuel consumption rate;

said program director means including pre-programmed dedicated memory means for storing programs comprising a sequence of steps including instructions to route data to and from and perform computational functions by said calculator means to solve each of the navigational, performance and time related problems within the repertoire of the computer, said instructions calling for the manual entry of data in a predetermined sequence in the course of the programs; and

said interfacing circuit means including means operable in response to actuation of one of said program selector keys to initiate a selected program stored in said memory means, and pursuant to instructions from said memory means to operate said calculator means to perform computational functions on input data after entry via said input data and enter keys in the course of the selected program and on data routed from said register means,

and display encoder means for receiving output data from said calculator means pursuant to instructions from said memory means and connected to show the final solution to said problems visually on the numerical display.

3,979,058

OPERATOR PROMPTING SYSTEM FOR STORED PROGRAM CALCULATOR

Ronald. C. Katz, Indian Head Park; Aaron Aronson, and Clarence Turek, both of Glenview, all of Ill., assignors to Specialized Electronics Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 518,728, Oct. 29, 1974. This application Mar. 17, 1975, Ser. No. 559,062

Int. Cl.² G06F *9/18, 15/02*

U.S. Cl. 235—156 **9 Claims**

1. In a self-contained electronic computer for mathematical problems having: a housing including a plurality of data input keys, a plurality of program selector keys, a visual numerical display, calculator means for performing mathematical operations, a stored program controller, said controller having a plurality of programs stored therein for solving a plurality of mathematical problems, each of said programs comprising a routine of program steps, means coupling the controller to the calculator means for causing said calculator to perform the mathematical operations indicated by said program steps, at least some of said program steps requiring the manual entry of data during the course of the program via the data input keys of said keyboard, means coupling said program selector keys to said controller for selecting associated ones of the programs stored in said controller, an operator prompting system comprising means for visually indicating in conversational language with data titles the individual types of data to be entered during said programs, and means for driving said indicating means and operative in conjunction with said program steps requiring manual entry of data for displaying selected ones of said data entry titles to prompt the operator as to the type of data required by said program steps, whereby selection of a program is effective to cause said computer to demand the necessary input data in sequence and manipulate said data to calculate the desired results.

3,979,059

SYSTEMS FOR CONTROLLING THE TEMPERATURE WITHIN AN ENCLOSURE

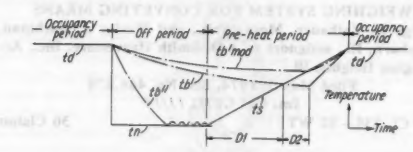
James Ralph Davis, 21a Pennyletts Garden, Stoke Poges, Buckinghamshire, and Peter Pressner, 525 Bath Road, Slough, Buckinghamshire, both of England

Filed Feb. 10, 1975, Ser. No. 548,766

Claims priority, application United Kingdom, Feb. 12, 1974, 6372/74

Int. Cl.² F23N *5/20*

U.S. Cl. 236—46 R **13 Claims**



1. A control means for regulating the operation of a system for controlling the temperature within an enclosure so that a desired temperature within the enclosure is attained at a predetermined time, the control means comprising:

I. thermal conditioning apparatus for said enclosure;

II. first means for generating a first signal representative of the temperature within the enclosure;

III. second means for generating a second signal representative of a temperature set point which changes at a predetermined rate prior to said predetermined time and equals said desired temperature at said predetermined time;

IV. third means for generating a third signal representative of the temperature outside the enclosure; and

V. fourth means connected with said first, second and third means for bringing said thermal conditioning apparatus into operation in response to the existence of a particular relation between said first and second signals,

VI. said particular relation between said first and second signals varying with said third signal so as increasingly to delay the operation of the thermal conditioning apparatus as the outside temperature changes towards said desired temperature.

3,979,060

AUTOMATIC MULTIPLE UNIT CONTROL APPARATUS

James Allen Tierce, 723 Melrose St., Richardson, Tex. 75080

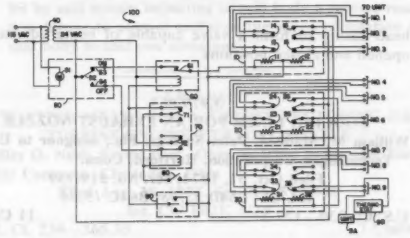
Filed Mar. 20, 1975, Ser. No. 560,156

Int. Cl.² F23N *5/20;* **G05D** *23/00*

U.S. Cl. 236—46 R **7 Claims**

1. Apparatus for controlling a plurality of devices to be alternately enabled and disabled during predetermined cyclically recurring time periods including: two state programmable timer means arranged to be in a first of its states during those of said time periods when said plurality of devices are to be enabled and in the second of its states during those of said time periods when said plurality of devices are to be disabled; a plurality of bistable elements connected in chain-like configuration to said timer means so as to sequentially switch in a predetermined order from their first states to their second states responsive to said timer means changing from its first

state to its second state and to sequentially switch in said predetermined order from their second states to their first states responsive to said timer means changing from its second state to its first state, said bistable elements including delay means so that the sequential switching is spread out over a predetermined period of time; switch means operatively connecting said plurality of devices to respective ones of said plurality of bistable elements so as to enable each of said devices when its respective bistable element is in its first state and to disable each of said devices when its respective bistable element is in its second state; manually operable override switch means for providing an indication that said devices are



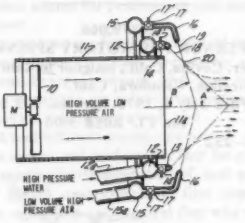
to be enabled; override enabling means connected to said override switch means and responsive to said indication for switching said bistable elements to their first states; override disabling means interposed between said override switch means and said override enabling means, said override disabling means being responsive to said indication from said override switch means and to said timer means changing to its first state for opening the connection between said override switch means and said override enabling means, and said override disabling means being further responsive to a subsequent termination of said indication from said override switch means for closing the connection between said override switch means and said override enabling means.

3,979,061

METHOD AND APPARATUS FOR MAKING ARTIFICIAL SNOW

Everett F. Kircher, P.O. Box 32, Boyne Falls, Mich. 49713

Filed Feb. 4, 1974, Ser. No. 439,574
Int. Cl.² F25C *3/04*
U.S. Cl. 239—2 S **26 Claims**



1. Apparatus for making and depositing artificial snow comprising, in combination,

means providing a substantially unidirectional large volume movement of air in outside ambient air substantially at atmospheric pressure,

first nozzle means disposed externally of said air movement and providing a high velocity water spray directed into said unidirectional air movement at a first angle with respect to the direction of movement thereof, and

second nozzle means distinct from said first means disposed externally of said air movement and communicating with a source of compressed air providing a high velocity expanding air stream directed into said unidirectional movement at a second angle with respect to the direction of movement thereof, one of said nozzle means being disposed radially between the major central axis of said unidirectional air movement and the other of said nozzle means, said first and second nozzle means being oriented with respect to one another such that said air stream intersects said water spray at an unconfined point remote from said first and second nozzle means in the outside ambient air such that droplets in said water spray are driven into and substantially dispersed within said air movement by the conjoint action of the momentum of said water spray and the additional forces imparted thereto by said air stream, and at least a portion of said water droplets are frozen into seed crystals by the refrigerating action of said high velocity expanding air stream.

20. The method of making and depositing artificial snow comprising the steps of

providing a large volume movement of air at atmospheric pressure having a temperature less than 32°F.,

directing a high velocity spray of water into said movement from a point externally thereof at a first angle with respect thereto, and

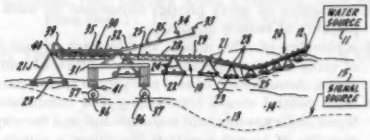
directing a high velocity air stream into said movement from a point externally thereof at a second angle with respect thereto so as to impinge said water spray when both said air stream and said water spray are unconfined, such that droplets in said water spray are substantially dispersed within said air movement and at least some of said spray droplets are frozen by expansion of said air stream to form seed crystals.

3,979,062

PERIPHERAL WATER BALANCE CONTROL FOR CENTER PIVOT IRRIGATION SYSTEM

Dale A. Christensen; Carl R. Ostrom, both of Omaha, and Ronald L. Frankenstein, Fremont, all of Nebr., assignors to Valmont Industries, Inc., Valley, Nebr.

Filed Nov. 26, 1975, Ser. No. 635,278
Int. Cl.² B05B *17/04, 3/18*
U.S. Cl. 239—11 **18 Claims**



15. A method of water balance control for a center pivot irrigation system of the kind including an elongated main conduit assembly having an inner end pivotally connected to a water source at a central pivot point and having a plurality of discharge nozzles at spaced intervals along its length, main drive means for moving the main conduit assembly around the pivot point to irrigate a primary field area of circular configuration, an elongated auxiliary conduit assembly having an inner end connected to and movable with the outer end of the main conduit assembly and having a series of discharge nozzles at spaced intervals along its length, and auxiliary drive means for moving the auxiliary conduit assembly over a range between a fully contracted position and a fully extended position, relative to the main conduit assembly, to irrigate at least one secondary field area beyond the periphery of the primary field area, water balance control method comprising the steps of:

sensing angular movements of the auxiliary conduit assembly, within its range, relative to the outer end of the main conduit assembly,

and regulating the rate of water discharge from the auxiliary conduit nozzles in accordance with the position and direction of movement of the auxiliary conduit assembly within its range by actuating the individual discharge nozzles of the auxiliary conduit assembly between closed and maximum open conditions in accordance with two predetermined programs, one for swing-out motion and one for swing-in motion of the auxiliary conduit assembly.

3,979,063

INSECTICIDE SPRAY SYSTEM

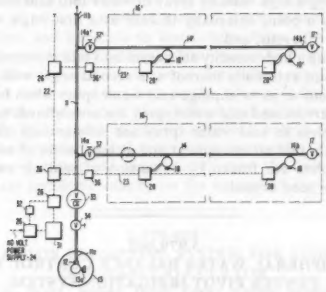
Grady W. Query, 3534 Central Ave., Charlotte, N.C. 28202

Filed June 26, 1973, Ser. No. 373,879

The portion of the term of this patent subsequent to Aug. 7, 1990, has been disclaimed.

Int. Cl.² B05B *12/02*

U.S. Cl. 239—70 **10 Claims**



1. A distribution system for a combination of liquid gas comprising:

a. a main conduit through which said combination may flow;

b. a plurality of branch conduits, through which said combination may flow, connected to said main conduit at one end and closed at the other end;

c. a plurality of spray nozzles connected on each of said plurality of branch conduits;

d. a plurality of valve means, one on each of said plurality of spray nozzles, operable to control flow of said combination through each of said plurality of spray nozzles; and

e. flow control means introducing said combination of a liquid and a gas into said main conduit and thereby to said plurality of branch conduits, including a supply source, and for maintaining said combination of a liquid and gas in similar proportions in said main conduit and said plurality of branch conduits as it is in said supply source.

3,979,064

SHOWER HEAD

Lars Nordentoft, Menden, Germany, assignor to ITT Industries, Inc., New York, N.Y.

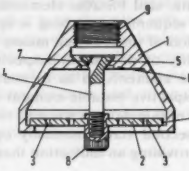
Filed Nov. 6, 1975, Ser. No. 629,485

Claims priority, application Germany, Dec. 14, 1974, 2459316

Int. Cl.² B05B *1/14*

U.S. Cl. 239—107 **7 Claims**

1. A shower head for regulating the flow of water comprising a shower head casing, a flexible diaphragm-like disc retained by its edge in the shower head casing, a plurality of outlet holes arranged in said flexible disc, means supporting the center of the disc on one end of a valve rod, and a valve cone supported concentrically on the other end of the valve rod, the valve cone being fitted to a valve seat in the shower head casing to form a valve capable of being adjusted to opened and closed positions.



3,979,065

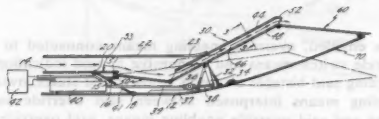
COOLING LINER FOR AN EXHAUST NOZZLE

William M. Madden, Palm Springs, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 31, 1974, Ser. No. 519,739

Int. Cl.² B64D *33/08*; B64C *15/06*

U.S. Cl. 239—127.3 **11 Claims**



1. In combination with jet engine fixed structure including an exhaust duct, an exhaust nozzle mounted on said fixed structure, said nozzle comprising a circumferential row of flaps, means pivotally mounting said flaps on said fixed structure for controlling the flow area of said exhaust duct, seal means being positioned between each pair of flaps to prevent leakage therebetween, said flaps comprising an inner flap member having an outer flap member spaced therefrom, said seal means comprising an inner seal member having an outer seal member spaced therefrom, said inner seal member being positioned to cooperate with each adjacent inner flap member and said outer seal member being positioned to cooperate with each adjacent outer flap member providing a passageway for coolant flow through said flaps and seals said passageway having an inlet and outlet, means for directing a coolant flow into the inlet of said passageway.

3,979,066

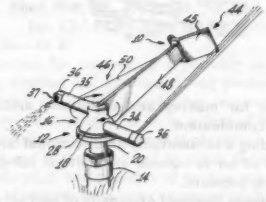
GOVERNOR FOR ROTARY SPRINKLER

Bennie Fortner, Covina, Calif., assignor to Rain Bird Sprinkler Mfg. Corporation, Glendora, Calif.

Filed July 1, 1975, Ser. No. 592,165

Int. Cl.² B05B *3/06*

U.S. Cl. 239—252 **11 Claims**



1. In a reaction drive rotary sprinkler of the type primarily intended for use in irrigating plants, and which includes a body supported for rotation in one direction, at least one spray

nozzle attached to said body for rotation therewith and disposed to eject a water stream having a velocity component in a tangential direction relative to the axis about said body rotates whereby a reaction torque for rotating said body in said one direction produced, the improvement comprising:

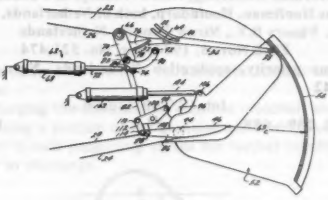
governor means for controlling the speed of rotation of said body and attached to said body for rotation therewith, said governor having a reaction means disposed to be laterally spaced from the path of the stream ejected from said nozzle when said body is rotating at or below a preselected speed in said one direction, and to be hit by said stream when said body is rotating in said one direction above said preselected speed, said reaction means when hit by said stream imparting to said body a reverse reaction torque to control and slow the speed of rotation of said body in said one direction.

3,979,067

ACTUATING MEANS FOR A THRUST VECTORING GAS TURBINE ENGINE EXHAUST NOZZLE

Dudley O. Nash, Forest Park, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Apr. 28, 1975, Ser. No. 572,341
Int. Cl.² F02K *1/20*
U.S. Cl. 239—265.35 **7 Claims**



1. In a gas turbine engine flight maneuverable exhaust nozzle including a plurality of substantially opposed walls partially defining an exhaust stream flow path; variable position convergent-divergent means partially defining a first of said walls; deflector means positionable between a stowed position external to the exhaust stream flow path and a deployed position further defining the exhaust stream flow path; and a variable position ventral flap partially defining a second of said walls, the improvement comprising:

first actuation means for positioning said convergent-divergent means;

second actuation means for deploying said deflector means;

first cam and follower means operatively connecting said convergent-divergent means and said ventral flap for providing simultaneous relative movement thereof when said deflector means is stowed; and

second cam and follower means operatively connecting said deflector means and said ventral flap for providing simultaneous relative movement thereof, said second cam and follower means overriding said first cam and follower means to reposition said ventral flap when said deflector means is deployed.

3,979,068

SPRAY NOZZLE ASSEMBLY FOR A WINDSHIELD OF AN AUTOMOBILE

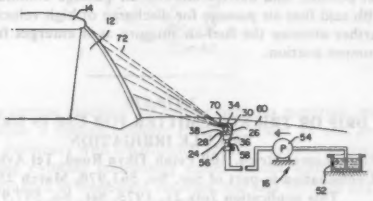
Beverly Applebaum, Toronto, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed July 14, 1975, Ser. No. 595,670
Int. Cl.² B60S *1/52*; B05B *1/10*, *1/26*
U.S. Cl. 239—284 R **3 Claims**

1. A spray nozzle assembly for a windshield of an automobile adapted to be coupled to a fluid supply assembly of said automobile, which comprises:

a. a housing having a base, a top, a pair of upwardly extending distal end walls, an upwardly extending rear wall, an upwardly extending front wall with an elongated slotted aperture therein, an interior chamber, and a plurality of passageways extending between said interior chamber and said slotted aperture, said front wall being longer than said rear wall;

b. a mounting leg having a continuous bore therethrough affixed to said housing, said bore communicating in a fluid serial connection with said interior chamber, said mounting leg adapted to be mounted on a bracket member affixed to said automobile;



c. a spray nozzle member affixed into each said passageway, said nozzle members in combination adapted to direct a spray of fluid onto said windshield, each said nozzle spray member angled relative to a latitude median of said housing, each said nozzle member including an outer conical section having a base and an apex with a pinhole aperture therein and a cylindrically shaped rod section affixed linearly to said base, said conical and said rod section having a continuous tapered bore therethrough, said rod section mounted into said passageway, each said spray nozzle member recessed into said front wall; and

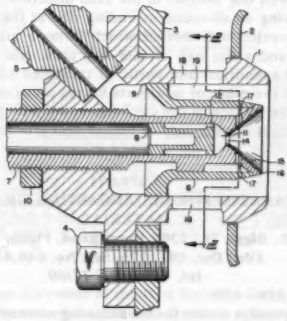
d. a water deflector shield affixed onto said housing, said deflector shield deflecting said fluid spray onto said windshield, said deflector shield, said mounting leg, and said housing are of a unitary construction.

3,979,069

AIR-ATOMIZING FUEL NOZZLE

Luigi Garofalo, 1583 Sunview Road, Lyndhurst, Ohio 44124

Filed Oct. 11, 1974, Ser. No. 514,118
Int. Cl.² B05B *1/34*
U.S. Cl. 239—400 **4 Claims**



1. An air-atomizing fuel nozzle comprising a nozzle body assembly defining therewithin a fuel passage, and first and second air passages; a nozzle body means communicating with said fuel passage and having a vortex chamber to impart a

whirling motion to the fuel flowing through said fuel passage, and having a discharge orifice with an outwardly flared trumpet portion through which the fuel is discharged in the form of a swirling conical sheet; sleeve means in said assembly isolating said first and second air passages from each other; said trumpet portion between its ends having a circumferential series of holes opening thereinto from said first air passage for discharge of high velocity air jets into said trumpet portion to atomize the swirling conical sheet of fuel as it flows around said trumpet portion; said second air passage surrounding said sleeve means and said trumpet portion to form an annular air discharge passage for mixing of air with the fuel-air mixture emerging from the large end of said trumpet portion; said sleeve means and body means defining therebetween a radially narrow annular air passage at the large end of said trumpet portion, said narrow annular air passage communicating with said first air passage for discharge of high velocity air to further atomize the fuel-air mixture as it emerges from said trumpet portion.

3,979,070

DRIP OR TRICKLE EMITTER FOR USE IN DRIP OR TRICKLE IRRIGATION

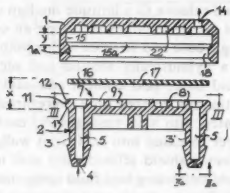
Moshe Lemelshtrich, 100 Petah Tikva Road, Tel Aviv, Israel

Continuation-in-part of Ser. No. 561,978, March 25, 1975. This application July 21, 1975, Ser. No. 597,914

Claims priority, application Israel, Mar. 26, 1974, 44502; Apr. 21, 1975, 47127

Int. Cl.² B05B *15/00*

U.S. Cl. 239—542 **7 Claims**



1. A plate-like drip or trickle emitter comprising two matingly connected disc-shaped parts press-fitted into one another, said parts together forming, at least in part from interior surfaces of both of said parts, a tortuous path for a flow of liquid in the interior thereof, at least one inlet provided at one end of said path and at least one outlet at the opposite end of said path, urging means being provided for urging contacting regions of said two disc-shaped parts into forced intimate contact with one another in the axial direction, a first of said parts having an all-round extending ribe at the inside of the circumferential wall thereof which forms a groove between said rib and a flat wall of said first part, said groove being partly of cylindrical and partly of truncated cone cross-section, and the other of said parts having a circumferential rib around the outside of the circumferential wall thereof whose cross-section corresponds to that of said groove.

3,979,071

APPARATUS FOR BROADCASTING GRANULAR MATERIAL

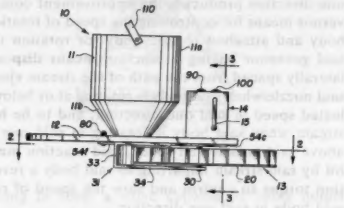
Charles L. Biggs, Jr., 2309 Regal Road, Plano, Tex. 75074

Filed Dec. 15, 1975, Ser. No. 640,437

Int. Cl.² A01C *17/00*

U.S. Cl. 239—653 **14 Claims**

1. A spreader device for broadcasting substantially granular material comprising: hopper means for holding said material, said hopper having a discharge opening in a bottom end thereof; a distributor wheel rotatably secured below said hopper, said wheel being provided with a plurality of outwardly opening compartments spaced around the periphery thereof; skirt means around a portion of said wheel closing the outward open ends of a portion of said wheel compartments as said compartments are filled with said granular material from said hopper; said wheel compartments being closed to discharge flow of said material therefrom while said compartments are in communication with said hopper; and means for rotating said distributor wheel.



3,979,072

DEVICE FOR SPREADING DISTRIBUTABLE MATERIAL COMPRISING A RECIPROCATORILY SWINGING PIPE-SHAPED DISTRIBUTOR

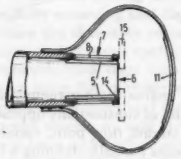
Pieter Adriaan Oosterling, Nieuw-Vennep, and Johannes Phillippus Hooftman, Hoofddorp, both of Netherlands, assignors to H. Vissers B.V., Nieuw Vennep, Netherlands

Filed Nov. 6, 1974, Ser. No. 521,474

Claims priority, application Netherlands, Nov. 8, 1973, 7315342

Int. Cl.² A01C *3/06*

U.S. Cl. 239—689 **10 Claims**



1. A device for spreading distributable material, for example fertilizer, comprising a hopper containing said material having a delivery port and a reciprocatorily swinging distributor pipe of synthetic resinous material communicating with said delivery port, more particularly a fertilizer distributor pipe, said distributor pipe having one end communicating with said delivery port and an opposite outlet end which whips horizontally back and forth to fling material over a wide swath, and a pair of wear-resistant layers on the inner surface of said distributor pipe at said outlet end thereof, each layer extending over a region beginning at a boundary spaced between said ends of the distributor pipe, extending therefrom to said outlet end and covering only the substantially upright portions of said inner surface.

3,979,073

METHOD AND APPARATUS FOR CONDITIONING GRANULAR MATERIAL

Raymond M. Leliaert, South Bend, Ind., assignor to Wheelabrator-Frye, Inc., Mishawaka, Ind.

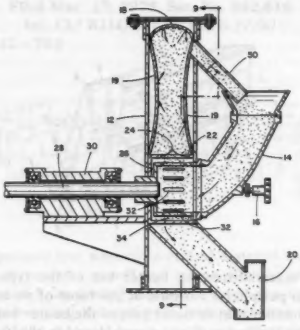
Filed Apr. 3, 1975, Ser. No. 564,860

Int. Cl.² B02C *19/06*

U.S. Cl. 241—5 **16 Claims**

14. A method for conditioning granular material to reduce buildup of contaminants on the surface thereof comprising the steps of:

a. supplying granular material to a projecting means;
b. continuously projecting said granular material in an upward path at a target with sufficient kinetic energy to strike said target and rebound therefrom downwardly through the continuing upward stream of material whereby substantial numbers of intergranular collisions



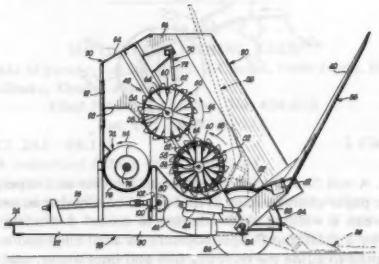
are produced to effect a reduction in surface contaminants;
c. discharging the conditioned granular material; and
d. returning a portion of the granular material striking said target to said projecting means for further conditioning prior to discharge.

3,979,074

METHOD AND APPARATUS FOR PROCESSING CROP STACKS

Allen Andrew White, Peabody; Ray Addison Adee, and Ronald Henry Knopp, both of Newton, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Oct. 11, 1974, Ser. No. 514,110
Int. Cl.² B02C *21/02*
U.S. Cl. 241—30 **29 Claims**



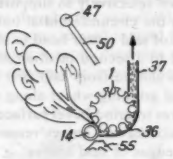
24. A method of processing a mass of animal foodstuffs which includes the steps of pressing the mass against disintegrating structure while on the move and while the structure progressively disintegrates the mass, and discharging the disintegrated foodstuffs in a continuous stream as said movement continues.

3,979,075

MACHINES FOR CUTTING WOOD AND OTHER LIGNEOUS MATERIALS INTO SMALL PIECES

Pierre D. Heron, Nogent sur Marne, France, assignor to Centre Technique du Bois, France

Filed July 3, 1974, Ser. No. 485,753
Claims priority, application France, July 5, 1973, 73.24796
Int. Cl.² B02C *18/22, 21/02*
U.S. Cl. 241—93 **17 Claims**



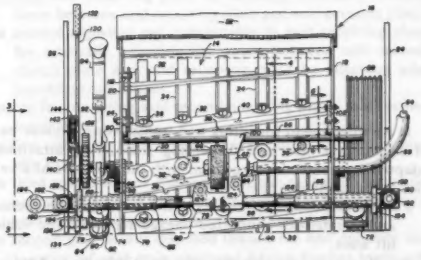
1. In a cutting machine for cutting ligneous materials into small pieces: a cutting cylinder rotatable about an axis and having a periphery with longitudinal recesses defined therein, the cutting cylinder comprising cutter blades with cutting edges, mounted in respective recesses, the said recesses each defining a cavity for pieces cut off a workpiece by the cutter blades, a reaction member having a working surface drivable around a closed path, a portion of the working surface being disposed adjacent to the cutting cylinder and being of a part circular form, and means governing the relative speeds of the cutting cylinder and the working surface such that the tangential speed of the cutting cylinder is higher than the speed of the working surface, the ratio between these speeds being constant whereby the length of the pieces cut is substantially constant, said reaction member being positioned in closely adjoining relation to the cutting cylinder to define therewith a curvilinear wedge shaped feed zone of decreasing size whereby substantially the entire reaction forces of cutting are applied between the cutting cylinder and reaction member.

3,979,076

GRINDING WHEEL GUIDE MEANS FOR FORAGE HARVESTER

David D. Stoltzfus, Gordonville, and Benjamin H. Snavely, New Holland, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed June 18, 1975, Ser. No. 588,095
Int. Cl.² B24B *19/00*
U.S. Cl. 241—101.2 **4 Claims**



1. In a forage harvester of the type having a frame, a shear bar stationarily mounted upon said frame, a cylindrical type cutter head having a plurality of similar knives spaced circumferentially around said head, power means to rotate said head about the axis thereof in shearing engagement of the knives thereof with said shear bar, said knives being skewed to dispose the cutting edges thereof within the circumferential outline of said cutter head and each knife having a similar

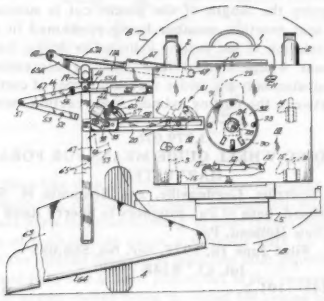
cutting edge and a bevel surface rearwardly thereof, guide means coextensive with said cutter head mounted in substantially parallel relation to the axis of said cutter head and positioned adjacent the circumferential outline thereof, a head movable along said guide means and rotatably supporting a grinding wheel to grind the cutting edges and bevel surfaces of said knives, power means to rotate said grinding wheel while the same traverses said knives, and means to move said head and grinding wheel relative to said knives; the improvement comprising support means for the opposite ends of said guide means adapted selectively to support the same in a first position parallel to the circumferential outline of the cutting edges of the knives of said cutter head to sharpen said cutting edges and movable to a second position in which one end of said guide means is shifted from said first position thereof to guide said head and grinding wheel along said bevel surfaces of said skewed knives to grind bevel surfaces of uniform depth and width along said skewed knives rearwardly of the newly sharpened cutting edges of said knives.

3,979,077

DISPENSING APPARATUS FOR CIRCULAR HAY BALES

Donald S. Dalman, P.O. Box 156, North Plains, Oreg. 97133

Filed June 13, 1975, Ser. No. 586,571
Int. Cl.² B02C *18/02*
U.S. Cl. 241—101.7 **7 Claims**



1. An attachment for lifting and transporting circular bales of hay or the like and dispensing same, said attachment adapted for coupled engagement with the lift arms of a vehicle, said attachment comprising,

a frame disposed transversely and forwardly of the vehicle and adapted for supported engagement with the vehicle lift arms,

spindle means rotatably mounted on said frame and projecting forwardly therefrom for inserted engagement with a bale,

means on said frame imparting rotation to said spindle,

an elongate cutter assembly supported by said frame in offset parallel relationship to said spindle means, and

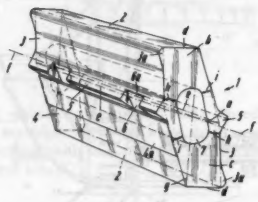
means mounted on said frame urging said cutter assembly toward and away from the bale for dispensing the baled material.

3,979,078

BEATER BAR FOR ROTORS OF IMPACT MILLS

Hans-Joachim Böddeker, Munster, and Rolf König, Handorf, both of Germany, assignors to Hazemag Dr. E. Andreas KG, Munster, Germany

Filed Mar. 14, 1975, Ser. No. 558,719
Claims priority, application Germany, Mar. 15, 1974, 2412507; Mar. 15, 1974, 2412508
Int. Cl.² B02C *13/28*
U.S. Cl. 241—191 **17 Claims**



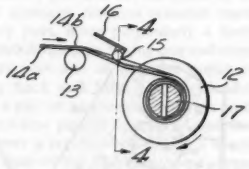
1. In a material-treating beater bar of the type which is mounted in peripheral cut-outs of the rotor of an impact mill in such a manner that an outer part of the beater bar side face which is the leading surface as considered in the direction of rotation of the rotor projects freely beyond the rotor periphery and directly contacts material to be treated, the improvement wherein said side face and another side face parallel thereto are each provided with a longitudinally extending rib, said ribs each being offset from the longitudinal midpoint line of the respective side faces in opposite directions, said side faces due to the offsetting of the ribs each having a larger and a smaller face portion of which the larger face portions partially overlap one another.

3,979,079

ROLL FILM WINDING MECHANISM

Katsuaki Ohashi, Shiki, and Hirao Monde, Tokyo, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Oct. 28, 1975, Ser. No. 626,313
Claims priority, application Japan, Nov. 5, 1974, 49-127396
Int. Cl.² B65H *23/10*
U.S. Cl. 242—75.2 **10 Claims**



1. A roll film winding mechanism for film and superposed liner paper characterized in that a tension member is arranged between a winding shaft adapted to mount a winding spool having a shaft and flanges adjacent its axial ends and a roller adapted to guide the traveling film and liner paper, said winding spool shaft and roller defining a plane including the common tangential line connecting the outer circumferences thereof on the film-contacting side of the roller, said tension member being arranged to bias the film and liner paper in a direction from the remote side of said plane toward the side of said plane on which said winding spool and roller are located, said tension member including means for curling both the liner paper and the film inwardly so that, during film

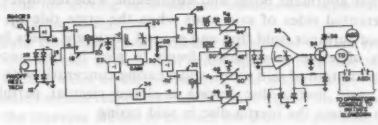
winding, the opposite edges of said liner paper are brought into contact with the base portions of said flanges adjacent to where said flanges are connected to said winding spool shaft.

3,979,080

ANALOG AUTOMATIC SLOWDOWN SYSTEM

Roger B. Herbert; Harvey A. Horowitz, both of Williamsville, and Donald F. Barrett, Buffalo, all of N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 27, 1975, Ser. No. 562,616
Int. Cl.² B21C *47/16;* **B21B** *37/00*
U.S. Cl. 242—78.6 **5 Claims**



1. In a process line wherein a coil of material mounted on a mandrel driven by a payoff reel motor, is being unwound at a linear speed S, an analog automatic slowdown control system for determining the optimum instant of time to initiate slowdown of the material being payed out, comprising:

a. means for determining the instantaneous diameter of the coil of material to derive a signal *d;*

b. means for differentiating, connected to receive said signal d and deliver a signal *d'*, where *d'* is the derivative of the instantaneous diameter d with respect to time;

c. means for deriving a signal s which is a function of said linear speed;

d. means for deriving a signal n which is a function of the speed of the payoff reel motor;

e. means for determining the desired remaining portion of the coil diameter after stopping, adapted to receive said signals *d'*, *s*, and to deliver an output signal which is a function of (d'/s);

f. means for determining the change in the diameter of the coil of material during deceleration adapted to receive said signals *d'*, *s*, and to deliver an output signal which is a function of *d'*, *s;*

g. means for deriving an analog signal do which is a function of the diameter of said mandrel, and

h. means for summation adapted to receive the signals: *d*, do, functional signals (d'/s) and *d's*, and to deliver an initiation signal to begin slowdown when the signal *d* equals the sum of said other signals.

3,979,081

MOTORIZED FISHING REEL

Toshiaki Miyamae, Lot 16, No. 2, 2-Chome, Nishi-Iwata, Higashi-Osaka, Osaka, Japan

Filed Feb. 1, 1974, Ser. No. 438,618
Int. Cl.² A01K *89/017*
U.S. Cl. 242—84.1 A **2 Claims**

1. A motorized fishing reel comprising

an electric motor having a drive shaft;

a first pinion affixed to said drive shaft of said motor;

a driven shaft having a large diameter portion at one end and a smaller diameter portion at the other end and a square section portion therebetween, a part of said large diameter portion having threads thereon;

a reduction gear rotatably held by the large diameter portion of said driven shaft and engagable with said first pinion;

a second pinion affixed to the smaller diameter portion of said drive shaft;

a first clutch plate affixed to said square portion of said driven shaft;

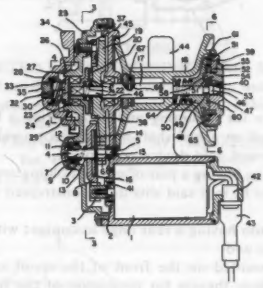
a first friction member affixed to said reduction gear and positioned to be contactable with said first clutch plate;

a manually operable first adjusting nut screwable into said threads at said outer portion of said large diameter portion of said driven shaft;

anti-rotation device connected to said adjusting nut to prevent said nut from moving after manual operation;

first spring means disposed between said anti-rotation device and said reduction gear whereby said first adjusting nut controllaby adjusts the force of said first spring means to normally press said first clutch plate against said first friction member thereby to controllably transmit rotation of said reduction gear to said second pinion;

a rotary shaft having a small diameter portion, a tapered portion having an annular groove therein and a square



section portion and disposed parallel to the axis of said second pinion;

a mounting structure for supporting said rotary shaft;

a main gear movably supported on said small diameter portion of said rotary shaft and engagable with the said second pinion;

a second friction member affixed to said main gear;

a second clutch plate affixed to said square section of said rotary shaft and being connectable with said second friction member

a bearing disposed on said second clutch plate with its axis coaxial with the axis of said rotary shaft;

a pressing plate disposed adjacent to said second clutch plate for pressing said bearing;

a receiving plate disposed opposite said pressing plate;

a second spring means disposed between said pressing plate and said receiving plate to normally maintain resilient force between said receiving plate and said pressing plate;

a second adjusting nut connectable to said receiving plate for manually adjusting the space between said second clutch plate and said receiving plate by adjusting said second spring means;

a cap for mounting said second adjusting nut to said receiving plate;

a first operating lever affixed to said cap for rotating manually said cap;

a third spring means disposed between said main gear and said second clutch plate for controlling the space between said main gear and said second clutch plate;

a second gear means disposed toward the end opposite the location of said main gear and having ratchet teeth and connected to said rotary shaft;

a ratchet pawl engagable with said ratchet teeth for preventing reverse rotation of said rotary shaft;

a second operating lever mounted on said mounting structure;

a cam affixed to said second operating lever; and

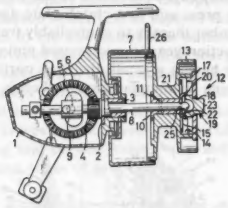
a third spring means for holding said cam in said groove of said small diameter portion of said rotary shaft.

3,979,082

FISHING SPINNING-REEL SPOOL MOUNTING AND DEMOUNTING DEVICE

Yasomatsu Morishita, Kure, Japan, assignor to Ryobi, Ltd., Hiroshima, Japan

Filed Apr. 2, 1975, Ser. No. 564,223
Int. Cl.[2] A01K 89/00
U.S. Cl. 242—84.2 R 4 Claims



1. A device for mounting and demounting a fishing spinning-reel spool on a reel shaft having slits provided near the front end thereof, said device comprising:

a plate spring having a pair of elastic holding arms sized and spaced to fit into said slits in the unstressed state of said arms;

a push button having a rear edge in contact with said holding arms; and

a cover mounted on the front of the spool and having a central hole therein for projection of the front edge of said push button therethrough;

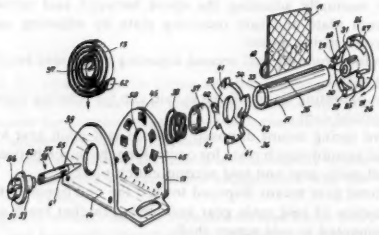
said holding arms each comprising outside plate portions bent away from the plane of said plate spring toward said rear edge of said push button to thereby form a pair of slanted cam faces against which said rear edges of said push button can be pushed to spread said arms apart and release said arms from confinement in said slits.

3,979,083

WINDING-UP DEVICE WITH AUTOMATIC LOCK FOR SAFETY BELT

Artur Föhl, Schelmenwasenstr. 68, 7061 Haubersbronn, Germany

Division of Ser. No. 250,010, May 3, 1972, Pat. No. 3,851,837.
This application May 31, 1974, Ser. No. 475,029
Claims priority, application Germany, May 6, 1971, 2122419; Dec. 22, 1971, 2163732
Int. Cl.[2] B65H 75/48
U.S. Cl. 242—107.4 R 28 Claims



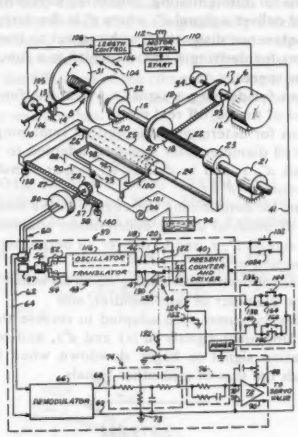
1. In combination with a winding device for a safety belt, a spool connected to one end of the belt, a return spring biasing the spool in take up direction, a housing having a base and end walls upstanding from the base and in which the ends of said spool are journaled, and a locking device operatively interposed between said spool and said housing operable in quick response to acceleration of said spool in pay out direction to lock the spool to the housing, said locking device comprising a support disc fixed to one end of said spool outside one end wall of said housing, an inertia disc loose on said spool between said one end wall and said support disc, axial cams on said support disc comprising straight surfaces inclining upwardly in a direction opposite to the pay out direction of rotation of said spool, said inertia disc having radial arms adjacent said straight inclined surfaces which ride up said surfaces when the spool is accelerated in pay out direction, first abutment noses on said one wall of said housing to abut one circumferential side of said arms when the arms ride up said inclined surfaces, and second abutment noses on said support disc at the upper ends of said inclined surfaces facing said first abutment noses and engageable with the other circumferential sides of said arms when the arms ride up said inclined surfaces, said first and second abutment noses being axially offset so as normally freely to pass by one another during rotation of said spool, and a casing concentric with said spool, said inertia disc having a closed circular periphery which centers the inertia disc in said casing.

3,979,084

APPARATUS FOR LEVEL WINDING TUBING

Robert C. Ruhl, Cleveland Heights, Ohio, and James E. Johnson, Southfield, Mich., assignors to Chase Brass and Copper Co., Inc., Cleveland, Ohio, by said Robert C. Ruhl

Filed May 1, 1975, Ser. No. 573,761
Int. Cl.[2] B65H 57/28
U.S. Cl. 242—158 F 6 Claims



1. A level wind arrangement for accurately level winding material of a substantially uniform transverse dimension comprising, in combination

reel means;

drive means for rotating the reel means with a torque sufficient to wind the material on the reel means;

traverse means for traversing one of the material and reel means with respect to the other, and comprising

a double acting, double rod hydraulic cylinder having a piston with two working faces, said faces having equal areas so that the traverse characteristics of the cylinder are the same in both a forward and a reverse direction;

pulse deriving means for deriving a pulse in response to each predetermined increment of rotation of the reel means from a start position so that rotating the reel means produces a first plurality of pulses;

means for dividing said pulses from said pulse deriving means by a quantity indicative of the transverse dimen-

sion of the material wound on the reel means to produce a second plurality of pulses;

means responsive to said second plurality of pulses for deriving a reel rotation signal indicative of the rotational position of the reel means, and comprising

a synchro transmitter having an input shaft,

motor means having a shaft driven a predetermined increment in response to each of said second plurality of pulses, and

transmission means connected between said motor shaft and synchro transmitter input shaft for rotating said input shaft an amount proportional to but different from the rotation of the motor shaft;

a synchro transformer having an input shaft;

means for driving said synchro transformer input shaft in response to traverse;

means connecting said synchro transmitter to said synchro transformer to derive an error signal in response to non-synchronism of the transmitter and transformer;

control means responsive to the error signal for controlling the traverse means to correct the traverse position of the reel means with respect to its rotational position, so that the transformer and transmitter move toward rotational synchronism to reduce the error signal, said means comprising,

servo-valve means colsely adjacent said hydraulic cylinder for controlling the flow of hydraulic fluid to said cylinder;

counter means for counting one of said series of pulses and comprising

means for discontinuing said second plurality of pulses to said motor means in response to the attainment of a predetermined first count, so that traverse in one direction ceases while the reel means continues to rotate; and

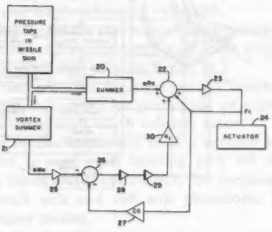
means responsive to a predetermined second count for again supplying said second pulses to the motor means, so that traverse commences in an opposite direction.

3,979,085

GUIDED MISSILE USING FLUIDIC SENSING AND STEERING

John P. Leonard, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 8, 1974, Ser. No. 513,015
Int. Cl.² F42B *15/18*
U.S. Cl. 244—3.15 **5 Claims**



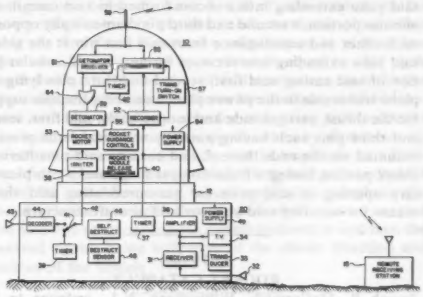
1. An attitude control system for a missile having attitude control means, the invention comprising: means for determining net aerodynamics force on said missile; means for determining net aerodynamic moment on said missile; an attitude control system connected to the said means; each of said means for determining and said attitude control system are fluidic; said means for determining net aerodynamic force includes pressure taps distributed in the skin of said missile; fluidic means for algebraically summing the pressure from said taps; said means for determining net aerodynamic moment includes fluidic means for algebraically summing weighted pressures from said taps; said attitude control system includes: first and second fluidic summing junctions each having inputs and an output; fluidic attitude changing means having a fluid input connected to the output of said first fluidic summing junction; wherein each of said means for determining has an output; first means for connecting the output of said means for determining net aerodynamic force to a first fluid input of said first fluidic summing junction; second means connecting the output of said means for determining net aerodynamic moment to a first fluid input of said second fluidic summing junction; third means connecting said output of said second fluidic summing junction to a second fluid input of said first fluidic summing junction; and fouth means connecting said output of said first fluidic summing junction to a third input of said first flidic summing junction and to a second input of said second fluidic summing junction.

3,979,086

ROCKETED DATA COMMUNICATION SYSTEM

James F. MacAdam, San Francisco, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 8, 1974, Ser. No. 522,158
Int. Cl.² F42B *9/00*; F41G *9/00*
U.S. Cl. 244—3.19 **4 Claims**



1. A data retrieval system for obtaining information emanating from a hostile region on the earth's surface comprising:

an information receiving station remote from said hostile region,

a rocket module, a surface module and an umbilical connector initially interconnecting said rocket module and said surface module for emplacement at the aforesaid region,

sensor means within said surface module for receiving said information and for converting that information into information signals of suitable electrical form,

recording means within said rocket module receptive of said electrical signals and connected originally through said umbilical connector to said sensor means for recording said electrical information signals, said rocket module including a transmitter, a rocket motor having associated ignition and guidance means, and a rocket module release mechanism,

means within said surface module for igniting said rocket motor and activating said release mechanism in response to a control signal to launch into near space only said rocket module, and

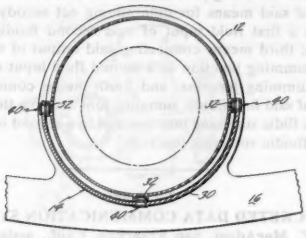
means responsive to attainment of an altitude above the earth's surface suitable for straight line transmission to said remote control station for activating said transmitter to transmit said control station the recorded information from said recording means.

3,979,087

ENGINE MOUNT

Paul A. Boris, Ellington, and Jon A. Marx, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed July 2, 1975, Ser. No. 592,440
Int. Cl.² B64D 27/18
U.S. Cl. 244—54 6 Claims



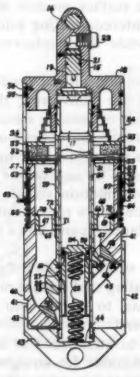
1. A support system to mount a turbine type power plant to aircraft structure wherein the power plant includes an outer case having a given annular portion adapted to receive the support system, a yoke for partially receiving said annular portion of said power plant case, a first pin at the bottom of said yoke extending into a recess formed in said case in said annular portion, a second and third pin diametrically opposing each other and equidistance from said first pin at the side of said yoke extending into recesses formed in said annular portion of said casing, said first, second and third pins lying in a plane transverse to the power plant axis being the sole support for the thrust, vertical, side and torque loads, said first, second and third pins each having partially spherical balls pivotally mounted on the ends thereof, and each of said pins having a shank portion having a frustoconical shape and a complementary opening in said yoke for accommodating said shank, means for securing said yoke to said aircraft structure.

3,979,088

ROCKET CATAPULT

Joseph B. McCormick, Willingboro, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 26, 1975, Ser. No. 617,208
Int. Cl.² B64D 25/10
U.S. Cl. 244—122 AB 6 Claims



1. In a rocket catapult ejection system for a seat-occupant mass of an aircraft having a catapult tube secured to said aircraft and rocket motor means having a head member at one end attached to an aircraft seat structure,

a guide tube secured at one end to said head member, slidably mounted on said catapult tube, and having a spherical pintle at its other end,

a booster cartridge seated in said head member and extending into said catapult tube,

releasable locking pin means initially securing said guide tube and catapult tube against relative longitudinal motion,

a control piston in said catapult tube and responsive to ignition of said booster cartridge for releasing said locking pin means,

a rocket tube secured at one end to said head member, surrounding and concentrically spaced from said guide tube, and housing a main rocket propellant grain,

a nozzle housing having a reduced portion slidably mounted in said rocket tube and an inclined throat member surrounding a portion of said spherical pintle to define an annular nozzle effective throat therebetween for providing a thrust vector of generated rocket gases at a predetermined angle inclination to the longitudinal axis of said guide tube and in alignment with a predetermined seat occupant mass center of gravity,

means biasing said nozzle housing away from said rocket tube, and

means for adjustably camming said nozzle housing to a desired position along the longitudinal axis of said guide tube in opposition to said biasing means,

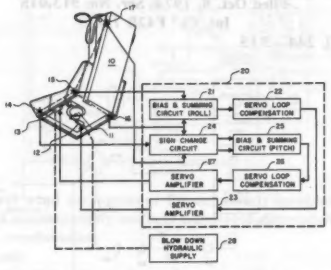
so constructed and arranged that said rocket thrust vector can be adjusted for deviations in said seat occupant mass center of gravity.

3,979,089

VERTICAL SENSING AND CONTROL SYSTEM

Ray A. Miller; Robert B. Dillinger, both of Ridgecrest; W. James Stone, China Lake, and Vernon D. Burklund, Ridgecrest, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 22, 1975, Ser. No. 615,867
Int. Cl.² B64D 25/10
U.S. Cl. 244—122 AD 11 Claims



1. An attitude seeking emergency escape vehicle, comprising:

a cradling member havng means for attachment to the body of a user;

propulsion means pivotally attached to said cradling member;

positioning means connected to said cradling member and to said propulsion means, said positioning means being responsive to guidance commands;

first attitude sensing means for detecting when said vehicle is inverted;

second attitude sensing means for detecting vehicle attitudes of pitch and roll relative to a predefined plane;

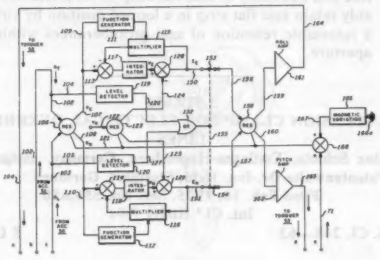
guidance command generating means communicating with said first and second attitude sensing means, and communicating with said positioning means,

for establishing and maintaining said vehicle in a predefined attitude during an escape maneuver.

3,979,090
VELOCITY DAMPED ERECTION SYSTEM FOR STABLE GYROSCOPIC ATTITUDE AND HEADING REFERENCE APPARATUS

David R. Brickner, and James S. Johnson, both of Phoenix, Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 17, 1975, Ser. No. 558,868
Int. Cl.² G05D *1/00*; B64C *13/18*
U.S. Cl. 244—175 **7 Claims**



1. In an erection system for a stable gyroscopic reference of the kind having stabilized craft pitch and roll accelerometer means, stabilized craft heading pick off means, and pitch and roll axis gyroscopic reference gimbal torquer means:

first resolver means responsive to said craft pitch and roll accelerometer means and to said craft heading pick off means for generating first and second outputs respectively representative of craft east and north accelerations,

first and second means for integrating said respective first and second outputs to yield respective third and fourth outputs respectively representative of craft east and north velocities,

second resolver means responsive to craft reference velocity and to said craft heading pick off means for generating fifth and sixth outputs respectively representativve of craft east and north reference velocities,

first combining means for algebraically combining said third and fifth outputs for generating a seventh output representative of craft east velocity error,

second combining means for algebraically combining said fourth and sixth outputs for generating an eighth output representative of craft north velocity error,

third resolver means responsive to said seventh and eighth outputs and to said craft heading pick off means for generating ninth and tenth outputs for torquing said respective pitch axis and roll axis gyroscopic reference gimbal torquer means,

first multiplier means responsive to said seventh output for providing an eleventh output for algebraically combining with said first output before supply of the latter to said first means for integrating said first output,

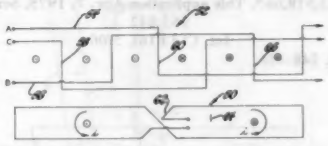
second multiplier means responsive to said eighth output for providing a twelfth output for algebraically combining with said second output before supply of the latter to said second means for integrating said second output, and

means for respectively controlling said first and second multiplier means in accordance with said first and second signals and thereby independently modifying said seventh and eighth signals whereby to modify the authority of said first and second signals in said seventh and eighth signals supplied to said pitch and roll axis gimbal torquer means.

3,979,091
COMMUNICATION SYSTEM FOR GUIDEWAY OPERATED VEHICLES

Forrest W. Gagnon, Littleton, and Arthur H. Marsh, Arvada, both of Colo., assignors to Otis Elevator Company, New York, N.Y.

Continuation of Ser. No. 389,766, Aug. 20, 1973, abandoned. This application June 6, 1975, Ser. No. 584,669
Int. Cl.² B61L *1/08*
U.S. Cl. 246—8 **23 Claims**

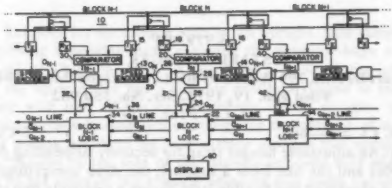


1. A communication system for a vehicle movable along a predetermined path, a transmission line extending along said path and including at least three conductors each conductor having a wave configuration, the cycle length of each wave configuration being the same for all of said conductors, the wave configurations in any one conductor being phase offset along the line from the wave configurations in at least two other of said conductors by a distance equal to said cycle length divided by the number of said conductors, an inductive loop coupled with the transmission line and adapted for movement with the vehicle, means for energizing said inductive loop with a continuous wave signal, whereby signals are induced in said conductors which vary in amplitude as a function of displacement of said vehicle along said path and which are of the same frequency, equal amplitude and phase displaced relative to each other, and receiver means coupled with said line for receiving the signals induced in said line, the received signals being indicative of the speed, direction and position of the vehicle.

3,979,092
SEQUENTIAL OCCUPANCY RELEASE CONTROL METHOD AND APPARATUS FOR TRAIN VEHICLES

Robert H. Perry, Canonsburg, and David H. Woods, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 3, 1975, Ser. No. 554,783
Int. Cl.² B61L *21/06*
U.S. Cl. 246—34 R **28 Claims**



1. In apparatus for controlling the speed of a plurality of train vehicles along a track including a plurality of signal blocks, the combination of

means for providing an occupancy indication signal in relation to the sensed occupancy of a first signal block by one of said train vehicles,

means for providing a first protection signal in response to said occupancy indication signal, and

means for providing an occupancy control signal in response to the provision of said occupancy indication signal and in response to said first protection signal to determine a zero speed code for a second signal block previous to said first signal block.

3,979,093

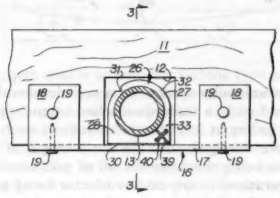
MEANS FOR MOUNTING PIPES AND CONDUITS IN STUDS AND JOISTS

James E. Madden, 14826 Skyline Blvd., Apt. 4, Woodside, Calif. 94062

Continuation-in-part of Ser. No. 407,534, Oct. 18, 1973, Pat. No. 3,918,667. This application Apr. 7, 1975, Ser. No. 565,812

Int. Cl.² F16L *5/00*

U.S. Cl. 248—56 **1 Claim**



1. A reinforcement for a conventional wall stud formed with a notch in one edge to receive a pipe extending transverse to said stud comprising an elongated metal plate dimensioned to fit along said one edge of said stud to bridge said notch and adapted to be secured to said stud to reinforce said stud in the area where said notch is formed and a flexible sleeve for said pipe, said sleeve having a straight base edge permanently fixed to said plate, a first side substantially perpendicular to said base extending from one end of said base, a top and a second side normally parallel to said first side engaging the opposite end of said base, said sleeve having a bore shaped to engage the outside of said pipe and being dimensioned to fit within said notch, said sleeve being formed with a split at the juncture of said base and said second side to permit said sleeve to be distended to be slipped over a pipe, said split being located out of contact with said plate, whereby said sleeve may be distended without interference from said plate, said sleeve being formed with a weakened portion to facilitate distention of said sleeve, and closure means adjacent said split to hold said sleeve with the edges of said split abutting each other, said closure means comprising enlargement of said sleeve having apertures parallel to said pipe on opposite sides of said split and fastening means fitting into the apertures in both said enlargements.

3,979,094

ADJUSTABLE HANGER STRAP

Stuart DeWitt, 799 Wendover Blvd., Muskegon, Mich. 49441

Filed Feb. 19, 1975, Ser. No. 550,982

Int. Cl.² F16L *3/14*

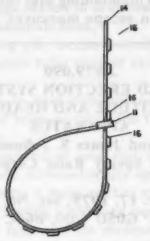
U.S. Cl. 248—60 **5 Claims**

1. An adjustable hanger strap for securely suspending pipes, cables and the like from a support, the strap comprising:

an elongated and flexible strip having a relatively thin cross-sectional thickness such that opposing facial surfaces are substantially wider than adjoining edge surfaces;

a plurality of spaced protuberances of solid material projecting outwardly from the plane of one of said facial surfaces of said strip, the protuberances having holes therethrough for positioning fasteners therethrough for securing the strap to supports; and

an aperture formed at one end of said flat strip, said aperture having a length at least as large as the width of said strip and a width less than the sum of the thickness of said strip and said protuberances, said aperture receiving the



free end extremity of said flat strip to form and to releasably retain said flat strip in a looped position by virtue of a releasable retention of said protuberances within said aperture.

3,979,095

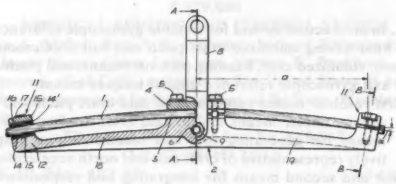
SUSPENSION CLAMP FOR ELECTRICAL OVERHEAD LINES

Heinz Schlotz, Esslingen-Hegensberg, Germany, assignor to Patentanwalte Dr.-Ing. Held, Stuttgart, Germany

Filed Feb. 18, 1975, Ser. No. 550,650

Int. Cl.² H02G *7/04*

U.S. Cl. 248—63 **5 Claims**



1. A suspension clamp for an electrical cable having a characteristic pitch including

clamping apparatus to clamp said cable along a portion of its longitudinal side;

means to support said clamping apparatus so that said clamping apparatus is free to move about an axis transverse to said cable;

two arms integral with and extending outwardly respectively from opposed sides of said clamping apparatus along but spaced from said cable; and

supporting devices for said cable, one of said supporting devices being mounted on each of said arms at a predetermined distance from said clamping apparatus said predetermined distance being approximately equal to said characteristic pitch.

3,979,096

MOUNTING ARRANGEMENT FOR HAND-HELD SHOWER HEAD

Claus D. Zieger, Covina, Calif., assignor to Interbath, Inc., El Monte, Calif.

Filed Nov. 30, 1973, Ser. No. 420,608

Int. Cl.² B05B *15/06*

U.S. Cl. 248—75 **6 Claims**

1. In a shower installation of the type having a rigid water supply pipe with an outlet from which pressurized water can be supplied to a shower head via a flexible hose which attaches to the supply pipe outlet and has insufficient rigidity of itself

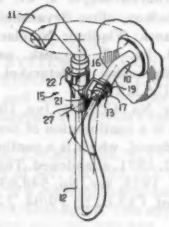
to support said shower head in an operable position, wherein said shower head is of the type which receives pressurized water at one end from said hose and issues the pressurized water from its opposite end after re-directing the water flow direction internally of the shower head, a mounting arrangement for said shower head, comprising:

a support member of regular polygonal periphery secured to said shower head proximate said one end thereof;

a bracket member having an apertured leg and a further leg oriented perpendicular to said apertured leg, means for fixedly securing said apertured leg to supply pipe with the supply pipe extending through the apertured leg such that said apertured leg is perpendicular to said supply pipe and said further leg is parallel to and spaced from said supply pipe;

a receiver member; and

means for rotatably securing said receiver member to said further leg to permit operator-initiated rotation of said



receiver member relative to said bracket member about a single axis extending perpendicular to said further leg; said receiver member including a hollow member having an opening at least as wide as the diameter of said flexible hose extending along the entire length of one of its sides, said hollow member having: a first longitudinally-extending section having a regular polygonal internal cross-section which matches but is slightly larger than the regular polygonal periphery of said support member; and a second longitudinally-extending section having a cross-section which is smaller than the support member periphery and larger than the circumference of said hose; whereby, upon positioning said support member in said first longitudinally-extending section said hollow member is capable of removably holding said shower head in a plurality of different rotational positions of said shower head about a second axis, said second axis being generally perpendicular to said single axis.

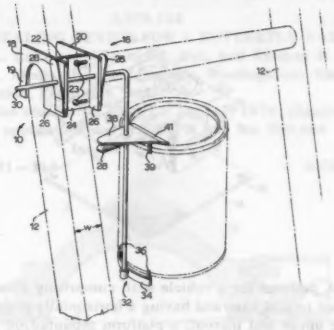
3,979,097

LADDER CADDY

John Alfred Balne, 1247 Haig Blvd., Mississauga, Ontario, Canada

Filed Aug. 19, 1975, Ser. No. 605,900
Int. Cl.² E06C *7/14*
U.S. Cl. 248—211 **6 Claims**

1. The combination of an accessory holder and an attachment frame for use with a ladder to provide ready engagement and detachment of said attachment frame in selected alternative positioned relation on said ladder, said accessory holder having a spindle portion for transverse sliding entry and engagement with said frame, said frame comprising a pair of spaced apart side members having plate means in connecting relation extending therebetween, hook means to engage a step portion of said ladder in drop-over hooking engagement, aperture means in said frame side members in mutual aligned relation to receive said spindle member in transverse sliding relation therethrough and manually operable lock means to transversely secure said spindle member relative to said frame



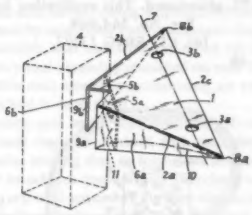
while permitting said accessory holder to pivot about the axis of said spindle under working loads.

3,979,098

SUPPORT FOR SECURING A SLAB TO AN UPRIGHT

Claude Louis Albert Vattier, Rue Lavoisier, 76260 Eu, France

Filed Aug. 5, 1975, Ser. No. 601,990
Claims priority, application France, Aug. 7, 1974, 74.27400
Int. Cl.² A47B *3/06*
U.S. Cl. 248—247 **10 Claims**



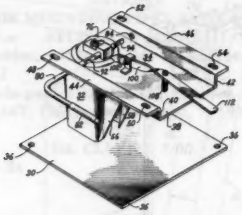
1. Support for securing a slab to an upright, said support comprising a bearing surface having the general shape of a triangle of which the apex of one angle is positionable adjacent the upright and has a suitable profile arranged to mate closely with part of the half-periphery of the upright, said bearing surface having two openings for the passage of slab-fixing means arranged on said surface along a line substantially parallel to the side of the triangle opposite said angle, each of the sides of the triangle adjacent said angle having a flange formed substantially at right-angles to said bearing surface, extending from the edge of said profile to a point on the side concerned situated at least slightly beyond the line of said openings with respect to the apex, the end sections of the flanges adjacent the profile being arranged so as to be supportable on the upright substantially along two generators of the latter, said support also comprising fastening means for securing the support to the upright.

3,979,099

VEHICLE SEAT PEDESTAL

Robert E. Strang, North Liberty, Ind., assignor to The Injection Plastic Co., Inc., Plymouth, Ind.

Filed Sept. 8, 1975, Ser. No. 610,993
Int. Cl.² F16M 13/00
U.S. Cl. 248—418 8 Claims



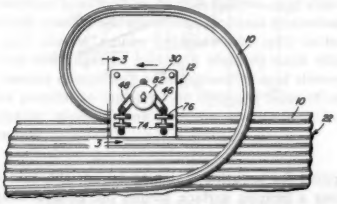
1. A pedestal for a vehicle seat, comprising a base, a post secured to said base and having a horizontally disposed plate at the upper end thereof, a platform mounted on the upper end of said post for angular movement on a horizontal plane, a pivot means connecting said platform to said plate, a lever pivoted on said pivot means, and locking means including a handle having a shaft for pivoting said lever to urge said plate and platform in firm contact for holding said platform in any horizontal angular position with respect to the vertical axis of said post, said pivot means including a bolt extending through said plate, platform and lever, and with said lever applying a compressive force against said three parts when said handle is moved to the position for locking said platform in fixed position with respect to the said post.

3,979,100

ENDLESS BAND WALL FORM

Buster C. Phillips, 550 Morgan St., West Liberty, Ky. 41472

Division of Ser. No. 416,324, Nov. 15, 1973, Pat. No. 3,888,959, which is a continuation-in-part of Ser. No. 238,805, March 28, 1972, abandoned. This application Apr. 3, 1975, Ser. No. 564,949
Int. Cl.² E04G 13/02
U.S. Cl. 249—48 4 Claims



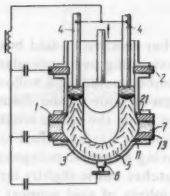
1. In a structural wall for use as a form against which a hardenable material is cast in a workable condition and permitted to harden, the improvement wherein said wall comprises a series of convolutions of an elongated strip of a substantially rigid material formed into an endless band, said strip being sufficiently flexible to permit it to be formed into said convolutions without permanent deformation thereof, and tongue and groove means integrally formed on opposed edge surfaces of said strip, said opposed edge surfaces being disposed in adjacent side-by-side relation with said tongue and groove means therebetween releasably interlocking successive ones of said series of convolutions in edge-to-edge relation to define a wall extending around a closed path with the convolutions forming the opposed ends of said wall being connected by a length of said endless band.

3,979,101

MOULD FOR CASTING AT LEAST ONE COMPONENT OF COMPLEX-SHAPED METAL ARTICLES

Boris Evgenievich Paton, ulitsa Kotsjubinskogo, 9; Boris Izrailevich Medovar, Bulvar Lesi Ukrainki, 2, kv. 8; Georgy Alexandrovich Boiko, ulitsa Vladimiro-Lybedskaya, 16, kv. 106; Ilya Iosifovich Kumysh, Vozdukhoflotsky prospekt, 42, kv. 51; Leonid Gustavovich Puzrin, ulitsa Vladimirskaya, 71, kv. 48; Viktor Alexandrovich Kovalev, ulitsa Ivana Kudri, 23/21, kv. 30; Georgy Sergeevich Marinsky, ulitsa Tatarskaya, 1"b", kv. 19; Alexandr Petrovich Beloglazov, ulitsa Ushinskogo, 5a, all of Kiev; Pavel Osipovich Siry, ulitsa Kotelnaya, 1/15, kv. 285; Alexandr Ivanovich Sopozhnikov, ulitsa Mosfilmovskaya, 17/25, kv. 63, both of Moscow; Valentin Alexandrovich Nosanov, prospekt Bolshevikov, 37/1, kv. 13, Leningrad; Volf Iudovich Babinovich, ulitsa Gagarina, 74, kv. 27, Chekhov; Lev Vasilievich Popov, ulitsa Kharkovskaya, 2, kv. 21, Bryansk; Sergei Mikhailovich Shelkov, ulitsa Bryanskoi proletarskoi divizii, 9, kv. 33, Bryansk; Vladimir Nikolaevich Strukov, ulitsa Kuibysheva, 13, kv. 17, Bryansk, and Boris Markovich Babich, ulitsa Bryanskoi proletarskoi divizii, 26, kv. 19, Bryansk, all of U.S.S.R.

Division of Ser. No. 432,154, Jan. 10, 1974, Pat. No. 3,894,574, which is a continuation of Ser. No. 323,379, Jan. 15, 1973, abandoned, which is a continuation of Ser. No. 120,141, March 2, 1971, abandoned. This application Feb. 7, 1975, Ser. No. 548,032
Int. Cl.² B22D 19/04, 27/02
U.S. Cl. 249—97 1 Claim



1. A mould for casting at least one component of a complex-shaped metal article, the mould comprising: a base plate; a housing mounting the base plate and fitted with at least one hole located in the fusion area of the mould, the number of holes being equal to the number of article components to be bonded by fusion to the at least one component being cast in the mould, and the geometric dimensions and shapes of the holes matching those of the fusion area of the article components to be bonded by fusion; and slots in the holes to provide expension of the holes from the mould interior to ensure the formation of a slag blanket in a volume required for a uniform removal of heat in the fusion area.

3,979,102

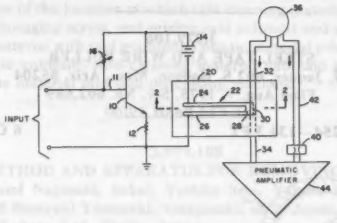
ELECTROFLUID CONVERTER

Aubrey Rodgers, Huntsville, and Rayburn K. Widner, Arab, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 22, 1975, Ser. No. 606,818
Int. Cl.² F16K 31/02
U.S. Cl. 251—11 3 Claims

1. An electrofluid converter comprising: an electrofluidic converter gate having a thermal expansion wire therein disposed to receive electrical stimulation for providing thermal expansion therein; a fluidic passageway through said gate; said thermal expansion wire being a single aluminum ribbon having first and second parallel, spaced apart, conductive members

terminated at one end in a thin, flat surfaced member having an edge positioned for linear movement across said passageway to restrictively vary the passageway opening in response



to thermal expansion; and an electrical power supply and variable coupling means connected respectively to the other ends of said ribbon for stimulating expansion of said ribbon.

3,979,103

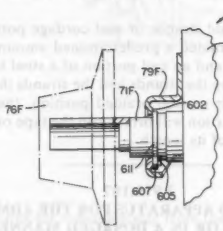
FUEL CONTROL SYSTEM AND CONTROL DEVICE THEREFOR OR THE LIKE

Charles D. Branson, and Roy C. Demi, both of Greensburg, Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 530,605, Dec. 9, 1974, which is a continuation-in-part of Ser. No. 443,783, Feb. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 380,389, July 18, 1973, abandoned. This application Apr. 23, 1975, Ser. No. 570,866

Int. Cl.² F16K *35/02*

U.S. Cl. 251—97 **2 Claims**



1. In a fuel control system for a fuel burning apparatus or the like having a source of fuel adapted to be interconnected by a passage defining means to main burner means of said apparatus, the improvement comprising a fuel control device disposed in said passage defining means and having poppet valve means that is directly manually operated for opening and closing said passage defining means so as to control the flow of fuel from said source to said main burner means, said control device having a selector means operatively interconnected to said poppet valve means to operate the same between its opened and closed positions, said selector means having latch means for latching said selector means in its off position when said poppet valve means is in its closed position, said control device having latch means cooperable with said latch means of said selector means for latching said selector means in said off position thereof, said selector means being axially movable to clear said latch means of said selector means from said latch means of said control device, said selector means being rotatable in the unlatched condition thereof to operate said poppet valve means, said latch means of said control device comprising a cam surface having a drop-off, said latch means of said selector means comprising a tang that cooperates with said drop-off of said cam surface to latch said selector means in said off position thereof, said cam surface being relatively long and gradual to permit said tang to ride up the same to said drop-off thereof without excessive feel of axial movement of said selector means as said selector means is moved to said off position thereof.

3,979,104

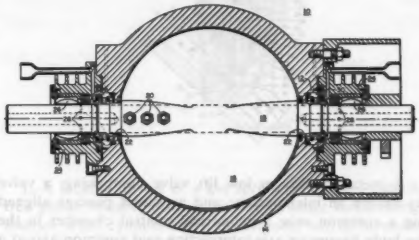
SHAFT SEALING DEVICE FOR A BUTTERFLY VALVE

Bernard L. LaCoste, Wilmington, Del., and Thomas H. McCloskey, Media, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 434,322, Jan. 17, 1974, abandoned. This application Mar. 18, 1975, Ser. No. 559,464

Int. Cl.² F16K *31/44*

U.S. Cl. 251—214 **4 Claims**



1. A butterfly valve for a steam turbine power plant comprising:

a valve casing defining a valve chamber therein,

a butterfly valve shaft mounted on a bearing for reciprocating angular rotation within said valve casing,

a butterfly valve disc mounted on said butterfly valve shaft for movement within said valve chamber, and,

a seal device for preventing leakage of a pressurized fluid from within said valve chamber along said butterfly valve shaft, said seal device being disposed within a seal chamber defined by said valve casing and said shaft and including a rotatable seal assembly mounted on said shaft and a stationary seal assembly mounted on said valve casing,

said rotatable seal assembly comprising an annular mating ring attached to said shaft,

said stationary seal assembly comprising first and second annular seal rings in contact with opposing surfaces of said annular mating ring to form first and second friction face seal interfaces respectively therebetween,

said stationary seal assembly further comprising first and second resilient bellows members disposed between said first and second annular seal rings, respectively, and said valve casing,

said first bellows member, said first annular seal ring and said annular mating ring defining a first region communicating with said valve chamber and containing a pressurized fluid to be contained therein by said seal device,

said second bellows member, said second annular seal ring and said annular mating ring forming a second region adjacent said second seal interface which communicated with a fluid for cooling said bearing, which fluid is sought to be not contaminated by fluid from said valve chamber,

said first and second bellows members, said first and second annular seal rings and said annular mating ring defining, on the side thereof opposite to said first and second regions, a third region filled with a fluid pressurized to a pressure greater than that of either said fluid in said valve chamber or said bearing coolant fluid to prevent contamination of said bearing coolant fluid by said fluid in said valve chamber.

3,979,105

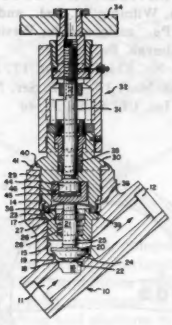
VALVE WITH IMPROVED FLOW PASSAGE

Eldert B. Pool, Pittsburgh, and Raymond L. Schweitzer, Allison Park, both of Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 402,165, Oct. 1, 1973, abandoned. This application Apr. 3, 1975, Ser. No. 564,956

Int. Cl.² F16K 47/04, 41/12

U.S. Cl. 251—121 4 Claims



1. A metal diaphragm low lift valve comprising: a valve body having an inlet passage and an outlet passage aligned along a common axis; a cylindrical control chamber in the valve body having an axis intersecting said common axis at a substantial angle of inclination; a circular passage in the valve body at one end of the control chamber coaxial therewith and fluidly connecting the inlet passage and the control chamber; a frusto-conical valve seat at said one end of said control chamber, said valve seat diverging outwardly from the circular passage and having a lesser diameter than said control chamber, said valve seat being coaxial with the axis of the chamber, the valve seat having a slant line in a plane of the common axis and the axis of the chamber substantially parallel to and extending a distance below the common axis with the outlet passage being adjacent thereto whereby a straight flow path is established along the common axis between said inlet passage and said outlet passage; means including a metal diaphragm sealing the other end of the chamber; said diaphragm having a limited axial flexure movement; means including a metal diaphragm sealing the other end of the chamber, said diaphragm having a limited axial flexure movement; means for imparting axial flexure movement to the diaphragm; a cylindrical closure disc mounted for movement along the axis of said control chamber in accordance with movement of said diaphragm; an outwardly diverging frusto-conical surface on said closure disc disposed opposite to and coaxially with said frusto-conical valve seat, said frusto-conical surface being diametrically coextensive with the valve seat and diverging outwardly therefrom at a shallow angle, said disc having a lesser diameter than said control chamber so as to establish outwardly thereof a region of considerably greater volume; an annular surface on the closure disc inwardly of the frusto-conical surface for sealingly engaging the inner periphery of the valve seat in a closed position to seal the said circular passage, said closure disc being axially movable along the axis of said control chamber to an open position a limited distance above said common axis as permitted by said limited axial flexure movement of the diaphragm, said closure disc in said open position partially obstructing the projected continuation of the inlet passage and defining an annular diffuser passage having a length of about four times the movement of the disc and a flow area less than the area of said circular passage thereby presenting a flow restriction passage at the entry of diffuser, said open position providing a sector within said projected continuation of the inlet passage providing direct fluid communication with minimum turbulence for a portion of the fluid flow between said inlet passage and said outlet passage, said diffuser passage providing a gradually increasing cross sectional flow area that permits fluid to expand gradually with a reduction of velocity for discharge to the control chamber and outlet passage with minimum pressure loss.

3,979,106

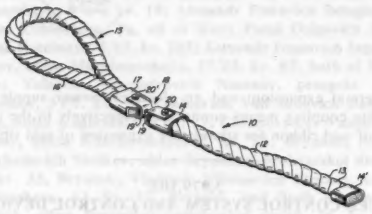
STEEL TAPE AND WIRE PULLER

Michael J. Jaques, 602 S. Hobson, Mesa, Ariz. 85204

Filed Aug. 7, 1975, Ser. No. 602,689

Int. Cl.² B65H 59/00

U.S. Cl. 254—134.3 FT 6 Claims



1. A steel tape and wire puller comprising:

a handle portion comprising a first elongated member forming a loop having a plurality of braided strands,

the ends of said first elongated member being interconnected by a first cap member,

a cordage portion formed of a plurality of strands of a pliable plastic material braided to form a second elongated member,

the ends of said second elongated member being interconnected by a second cap member, and

means for pivotally interconnecting the first and second cap members,

whereby when said strands of said cordage portion of said puller are unbraided a predetermined amount along the length thereof and an end portion of a steel tape or wire is layed between the strands and the strands then released to assume their normal braided position, the strands of the cordage portion will firmly grip the tape or wire along given portion of its length.

3,979,107

METHOD OF AND APPARATUS FOR THE ADMIXING OF A PIGMENT COLOR IN A DOSAGED MANNER INTO A PLASTICS MATERIAL GRANULATE

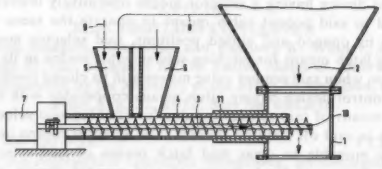
Adolf Lesk, Osterburken, Germany, assignor to AZO-Maschinenfabrik Adolf Zimmermann, Osterburken, Germany

Filed Oct. 10, 1973, Ser. No. 404,905

Claims priority, application Germany, Oct. 14, 1972, 2250561

Int. Cl.² B01F 7/02

U.S. Cl. 259—10 24 Claims



1. A process for admixing a controlled amount of a colorant in the form of a fine powder with a granulated plastic material being fed via a hopper to a plastics material processing machine, said process comprising feeding a quantity of a cleaning

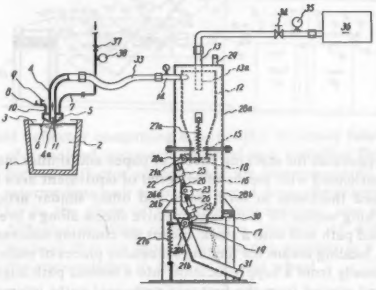
material comprising a coarse-particle plastic material to said hopper by means of a dosaging screw connected to said hopper, feeding to said dosaging screw said colorant so that said colorant and said cleaning material are fed together to said hopper, said colorant being fed to said dosaging screw downstream of the location at which said cleaning material is fed to said dosaging screw, and mixing said colorant and said cleaning material with said granulated plastic material prior to entry of said colorant, said cleaning material and said granulated plastic material into said processing machine.

3,979,108

METHOD AND APPARATUS FOR REMOVING SLAG

Katsumi Nagasaki, Sakai; Yoshito Seto, Yamato-Koriyama, and Hiroyuki Yamasaki, Amagasaki, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Jan. 15, 1975, Ser. No. 541,139
Claims priority, application Japan, Jan. 17, 1974, 49-89171
Int. Cl.² C21C 7/00
U.S. Cl. 266—201 17 Claims



1. Apparatus for removing slag from the surface of a molten metal, comprising:

a suction pipe having an inlet end adapted to be positioned above said surface so as to draw the slag therefrom;

means for supplying water to the interior of said suction pipe adjacent to the inlet end thereof to pelletize entering slag;

a separator hopper communicating with said suction pipe, said separator hopper having a slag discharge port and first valve means for opening and closing said discharge port;

exhaust means for evacuating said separator hopper and applying suction to said suction pipe;

an auxiliary hopper mounted in sealed relation to said separator hopper so as to receive slag from said discharge port, said auxiliary hopper having a slag discharge port and second valve means for opening and closing the same;

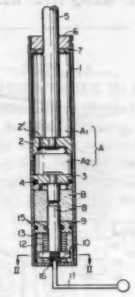
and control means for operating said first and second valve means alternately, said control means acting to open the discharge port of the separator hopper when the discharge port of the auxiliary hopper is closed and vice versa whereby slag can be continuously drawn into said separator hopper and intermittently discharged from said auxiliary hopper.

3,979,109

LOCKING DEVICE IN GAS SPRING

Kunio Ishida, Yokohama, Japan, assignor to Tokico Ltd., Japan

Filed Oct. 8, 1975, Ser. No. 620,854
Claims priority, application Japan, Oct. 14, 1974, 49-117867
Int. Cl.² F16F 9/49
U.S. Cl. 267—64 R 3 Claims



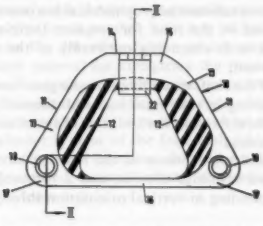
1. A locking device of a gas spring including a cylinder, a free piston slidably disposed in the cylinder for dividing the interior of the cylinder into a gas chamber and an oil chamber, and a piston slidably disposed in the oil chamber and having a piston rod projecting outwardly from the cylinder, the locking device comprises a free piston rod secured to the free piston and projecting outwardly from the cylinder, and means secured to the cylinder for engaging with and preventing movement of the free piston rod relative to the cylinder.

3,979,110

ENERGY ABSORBERS

Derek Alan Newton, Bushby, England, assignor to Dunlop Limited, London, England

Filed Mar. 26, 1974, Ser. No. 454,927
Claims priority, application United Kingdom, Mar. 29, 1973, 15164/73
Int. Cl.² F16F 7/12
U.S. Cl. 267—140 37 Claims



1. An energy absorber comprising in cross-section at least one limb of rubber-plastic composite material comprising a layer of rubber and an adjacent layer of plastics, said layers being united together and each extending substantially in the direction of the length of the limb, the layer of plastics material being capable of absorbing more energy than the layer of rubber during progressive deformation of the limb by bending or buckling when subjected to compressive forces acting substantially in a direction of the length of the limb, and the rubber, when deformed, being capable of storing sufficient

energy substantially to restore the energy absorber to substantially its original shape and configuration.

3,979,111

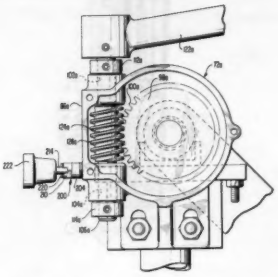
OUTBOARD MOTOR REPAIR STAND WITH LOCKABLE WORM GEAR SHAFT

Robert M. Kerr, P.O. Box 1135, Winter Garden, Fla. 32787

Continuation-in-part of Ser. No. 289,367, Sept. 15, 1972. This application Aug. 4, 1975, Ser. No. 601,289

Int. Cl.² B23Q 1/12; B25B 1/22

U.S. Cl. 269—76 **1 Claim**



1. In a repair stand for an outboard motor or the like, of the type including a base, and a standard assembly of changeable height connected to the base: that improvement comprising:

a horizontal cross plate fixedly secured to the standard in perpendicular relation thereto and projecting outwardly at opposite sides thereof;

a U-form channel member, including a bight portion and confronting, spaced apart arms, the bight portion being secured to the cross plate with the arms extending outwardly;

an elongated tube fixedly mounted in the channel member between the arms, the tube having a horizontal bore therein, and the tube extending outwardly of the cross plate at each side thereof;

a gear housing having inner and outer side walls, the inner side wall having an opening therein, base and top sections and end sections fixedly secured to the tube and to the plate;

an elongated substantially cylindrical horizontal main shaft positioned in the tube for rotation therein and having opposite ends extending outwardly of the tube at each side thereof;

one end of the shaft extending into the gear housing through said opening in said inner side wall thereof;

a worm wheel fixed to the one end of the main shaft within said housing;

the base and top sections of the housing having vertically coaligned openings therein, and a rotatable worm gear shaft extending in vertical orientation through said openings;

a worm drive gear on said worm gear shaft within the housing in mesh with said worm wheel;

an actuating handle on the worm gear shaft adjacent the top section of the housing in an upper, readily accessible location;

a single offset bar element having one end affixed to the end of said main shaft protruding from said housing;

a mounting saddle fixedly secured to the distal end of said element, the mounting saddle being parallel to the shaft, and being rotatable with the shaft responsive to turning of the actuating handle in a 360° arc, the angle of the mounting saddle relative to the base being constantly altered by said rotation;

a safety lock assembly comprising a plug member engaged in an end section of the gear housing;

the plug member having a chamber therein;

a shaft extending through the plug member and having an enlarged locking lug thereon;

a coil spring within the chamber constantly urging the locking lug in the direction of the worm gear shaft;

a handle on the safety lock shaft;

means for retaining the safety lock shaft in retracted position; and

the worm gear shaft having means thereon engaged by the locking lug to prevent further rotation of the worm gear shaft.

3,979,112

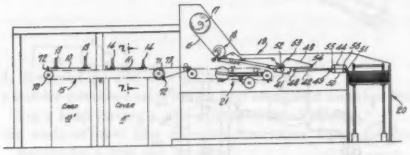
SHEET STACKING AND INTERLEAVING APPARATUS

Robert Munn, Garnerville, and Albert Tiso, Eastchester, both of N.Y., assignors to George Hantscho Company, Inc., Mount Vernon, N.Y.

Filed Feb. 6, 1975, Ser. No. 547,508

Int. Cl.² B65H 39/055

U.S. Cl. 270—58 **7 Claims**



1. Apparatus for stacking sheets of paper and similar material interleaved with pieces of material of equivalent area but increased thickness to form pads and other similar articles comprising means for feeding successive sheets along a predetermined path and onto a stack, means for counting successive sheets, loading means for feeding successive pieces of material periodically from a supply location into a second path aligned with and spaced from the first said path, said paths intersecting at a point spaced from said stack, means for periodically transporting said successive pieces of material along said second path to a position spaced from said supply location and adjoining said intersecting point, said transporting means also being periodically actuated by said counting means for propelling a leading piece of material in said second path adjoining said intersecting point through said intersecting point at the precise speed of movement of and in alignment with one of said sheets entering said intersecting point from said first path for deposition onto said stack and simultaneously advancing a successive piece of material into said position and feeding another piece of material into said second path, said counting means functioning to actuate said transporting and loading means each time a predetermined number of sheets have passed said point of intersection, a cutting station having cutting means, means for feeding a web to said cutting station to cut said web into said sheets, means carried by said cutting means and coupled with said counter for counting said sheets, said counter being operable upon the attainment of a predetermined count to actuate said transporting and loading means and to automatically reset and start the next successive count.

3,979,113

BICYCLE EXERCISING APPARATUS

Gerald A. Uhl, 35271 Drakeshire Place, Apt. 203, Farmington, Mich. 48024, and Johannes J. M. Pennock, 1815 E. Lincoln, Birmingham, Mich. 48008

Filed Jan. 28, 1975, Ser. No. 544,745

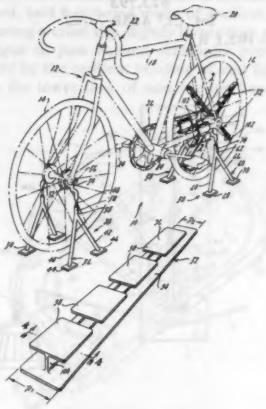
Int. Cl.² A63B 21/00

U.S. Cl. 272—73 **1 Claim**

1. An exercise device for use with a rotatable spoke-type wheel of an operator propelled vehicle,

said device including at least one air deflector rotatable with the wheel for increasing the resistance to rotation thereof, and

means cooperable with the spokes of the wheel supporting said deflector at a position extending generally radially between the center of rotation of the wheel and the outer periphery thereof,



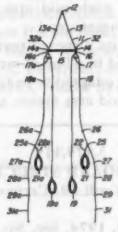
said deflector comprising a monolithic structure fabricated of a molded polymeric material and including first and second deflector sections that are interconnected by an intermediate web section arranged generally perpendicular to the plane of said deflector sections, one of said deflector sections comprising a plurality of deflector portions that are separated from one another in a radial direction relative to the axis of said wheel.

3,979,114

PUSH-PULL TYPE EXERCISING DEVICE

Anthony E. Codina, 2337 Cypress Ave., Lemon Grove, Calif. 92045

Filed June 12, 1975, Ser. No. 586,185
Int. Cl.² A63B 21/00
U.S. Cl. 272—126 **4 Claims**



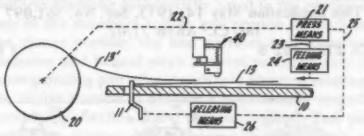
1. A device of the character described comprising two flexible lines, each line having a stirrup member at one end for receiving a person's foot therein and a loop member at the other end for grasping by a person's hand; said loop members being knotted onto said flexible lines between knots located at predetermined points on said lines; a pair of pulleys, each receiving one of the said flexible lines; an elongated, hollow spacer having an opening at each end, said spacer supporting said pulleys; a hanger line for said spacer passing longitudinally through the length of said opening of said spacer, said hanger line being knotted adjacent to said spacer, to prevent movement of said spacer with respect to said hanger line; additional knots being spaced apart on said hanger line to permit placement of said last mentioned additional knots on one side of a doorjamb so that on closing of a door the said additional knots remain on one side of a door and the spacer on the other; each of said pulleys having a rotatable eye member through which passes said hanger line as it goes through said spacer and through said outer surface openings and maintains said pulleys near the ends of said spacer.

3,979,115

SHEET LOCK FOR FEED TABLE IN PRINTING PRESS

Carl-Heinz Bruckner, Bensheim-Auerbach, and Claus Simeth, Offenbach am Main, both of Germany, assignors to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany

Continuation-in-part of Ser. No. 570,265, April 21, 1975, abandoned. This application June 19, 1975, Ser. No. 588,226
Int. Cl.² B65H 7/14, 7/08
U.S. Cl. 271—261 **14 Claims**



1. Means for interrupting the feeding of sheets to a sheet-fed printing press comprising, in combination, a press drive, a feed table, means defining a registered position of a sheet thereon, means coupled to the drive for feeding sheets across the feed table in succession into engagement with the registering means, a gripper cylinder, said gripper cylinder being coupled to the drive for picking up successive sheets following register intervals, retaining means having a retaining foot spaced opposite a sheet on the feed table and having provision for energization to press the foot downwardly against the sheet to immobilize the sheet so that it is not picked up by the cylinder, means for detecting failure of register of a sheet during a register interval for energizing the retaining means, time delay means interposed between the detecting means and the sheet retaining means to delay operation of the retaining means thereby to insure that the preceding sheet picked up by the gripper cylinder is clear of the feed table so that the foot presses downwardly upon the non-registered sheet, and means for permitting manual removal of the non-registered sheet from below the foot.

3,979,116

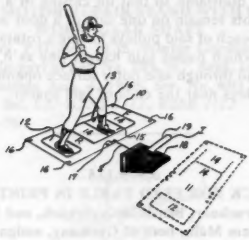
STRIDE-BOX

John T. Matchick, 126 N. Master's Court, Maumee, Ohio 43537

Filed Mar. 7, 1975, Ser. No. 556,333
Int. Cl.² A63B 69/40
U.S. Cl. 273—26 R **10 Claims**

2. A batter's training device comprising a planar sheet material defining a first area for receiving a batter's pivot foot and a second area for receiving a batter's stride foot, first closure means adjacent at least one of said first or said second

areas for adjustably setting a first distance between said first and said second areas and second closure means adjacent said



second area for adjustably changing the length dimension of said second area.

3,979,117

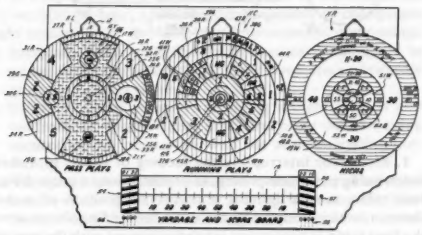
FOOTBALL DART BOARD GAME

Ronald E. Worsham, 2410 Bluebonnet, Houston, Tex. 77025

Continuation of Ser. No. 160,687, July 8, 1971, abandoned. This application May 14, 1973, Ser. No. 361,097

Int. Cl.[2] A63B *71/02*

U.S. Cl. 273—102 B 1 Claim



1. A football dart board game apparatus comprising:
a. dart board target means for receiving darts therein;
b. said dart board target means consisting of a plurality of aligned dart boards for receiving darts therein;
c. each of said dart boards consisting of at least one colored, circular area defining a dart target area thereon;
d. each of said dart boards also consisting of at least one colored ring defining dart target areas thereon;
e. each of said dart boards also consisting of at least one colored segment of a circular area defining dart target areas thereon;
f. at least one of said dart boards also consisting of at least one circumferentially and radially extending colored portion and wherein a part of such portion is of greater radial extent and of less circumferential extent than the remainder of such portion to define dart target areas thereon;
g. the arrangement of said target areas on one board being different from the arrangement of dart target areas on each other board whereby each board represents a particular type of football play; and
h. indications on said colored circular dart target areas, colored ring dart target areas, colored segment dart target areas and on said circumferentially and radially extending colored portion dart target area for indicating the results of various plays which may be made in a game of football when said target areas are penetrated by darts.

3,979,118

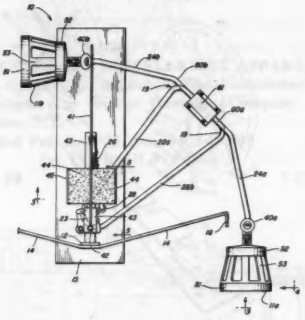
MARKSMANSHIP TARGET INCLUDING PIVOTING TARGET ARMS

Charles A. Saunders, and Thomas A. Saunders, both of Columbus, Nebr., assignors to Saunders Archery Company, Columbus, Nebr.

Continuation-in-part of Ser. No. 484,287, June 28, 1974, Pat. No. 3,915,454. This application Oct. 20, 1975, Ser. No. 623,793

Int. Cl.[2] A63B *71/02*

U.S. Cl. 273—102.1 R 10 Claims



1. In a target assembly including
a target support standard,
first and second targets,
arm means pivotally supporting each of said targets on said standard,
means interconnecting said arm means with one another to ensure concordant movement therebetween, and
biasing means for holding said arm means relatively fixed in each of a first and second rest position, in each of which rest positions a face of one of said targets is presented to the view of a marksman,
said arm means being shiftable through an arc about said standard and being responsive to the force of a missile striking one of said targets to overcome said biasing means and to pivot about said standard between the first rest position and the second rest position;
the improvement comprising damping means to preclude rebound of said arm means from a new rest position assumed when a missile strikes a target, said damping means comprising
a cushion carried by each said arm means and directed rearwardly of said targets; and
a cushion-engaging plate disposed rearwardly of said target support standard and in a line of movement of said cushion, said plate being adapted to engage said cushion upon pivotal shifting of said arm means about said standard.

3,979,119

GAME BOARD STRUCTURE

Claudio Cecchetti, Via Verdi 54, Cernusco sul Naviglio, Italy (20063)

Filed June 3, 1974, Ser. No. 475,692

Claims priority, application Italy, Oct. 30, 1973, 22631/73[U]

Int. Cl.[2] A63D *13/00*

U.S. Cl. 273—121 R 5 Claims

1. A game board structure comprising a support frame constructed in a single piece, a playing board supported by said frame and having an upper and a lower face, means for propelling a ball on to said playing board, a pair of repelling arms disposed close to one end of said playing board, two pushbuttons for operating said repelling arms, said two pushbuttons being slidably supported in opposing positions on the

lateral sides of said frame and being in line with said frame after having been pushed, and further comprising a plurality of holes of constant cross section provided in said playing board and a plurality of obstacles irremovably inserted in said holes, said obstacles each comprising spaced parallel feet and means for connecting said feet of said each of said obstacles together, said feet each comprising a head having a hooked projection defining a ledge spaced from said connecting means by an extent substantially equal to the thickness of said playing board, said feet being made of resilient material and said head having a cross size slightly larger than said holes and being arranged to pass beyond said holes provided in said playing board by the resilient bending of said feet, said ledge adhering to the lower face of said playing board while said

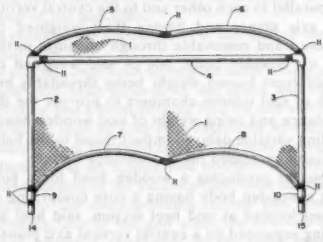
connecting means adhere to the upper face of said playing board preventing said feet from being removed through said holes, and further including a pair of levers, each of said levers connecting one of said pushbuttons with one of said repelling arms, and each of said levers having a shaped head at one end thereof, each of said pushbuttons having a seat arranged internally thereof for snap engagement with a corresponding one of said shaped heads of said levers, said levers each comprising near the other end two spaced through holes, said repelling arms each having a pin extending therebelow and projecting therefrom, the pin of one of said repelling arms rotatably engaging a corresponding one of said through holes of one of said levers and the pin of the other of said repelling arms rotatably engaging the corresponding other of said through holes of the other of said levers.

3,979,120

RESTORABLY DEFORMABLE HOCKEY GOAL

John Stuart Dietrich, c/o Harold Bick, Barrister and Solicitor, 905 Metro Trust, Windsor, Ontario, Canada

Filed Dec. 2, 1974, Ser. No. 528,918
Int. Cl.² A63B *63/00*
U.S. Cl. 273—127 B **4 Claims**



1. A restorably deformable hockey goal frame, comprising:

a plurality of rigid tubular frame members having internally threaded ends that are interconnectable to form the frame, said members including,

a pair of straight upstanding tubes spaced apart in substantially parallel relation;

a straight upper tube disposed transversely between and joining first upper end portions of the upstanding tubes, the combination of the three tubes defining a goal entrance;

a pair of curved upper tubes joined together at one end and having their free ends joined to corresponding second upper end portions of the upstanding tubes, the curved portions of said curved upper tubes extending rearwardly from the goal entrance;

a first pair of anchor members each having oppositely disposed first and second ends and a third end perpendicular thereto, the first ends being joined to respective ones of the lower ends of the upstanding tubes; and

a pair of curved base tubes joined together at one end and having their free ends joined to respective ones of the third ends of said anchor members, the curved portions of said base members extending rearwardly from the goal entrance;

and;

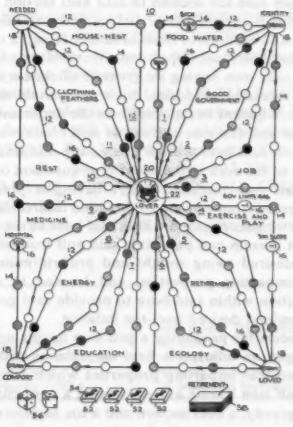
a plurality of resilient helical springs, individual ones of which flexibly interconnect the joined corresponding pairs of said ends, each spring having a center portion of uniform diameter substantially equal to the outside diameter of the members and an end portion on each side of the center portion, the end portions having an outside diameter and helical pitch adapted to threadably join a corresponding pair of said ends into abutting relation with the center portion to provide a substantially smooth and continuous flexible joint that is resilient and permits restorably displaceable movement between each corresponding pair of joined frame members.

3,979,121

EDUCATIONAL BOARD GAME

John Harris, 18717 Ramar St., Northridge, Calif. 91324

Filed Nov. 11, 1974, Ser. No. 522,337
Int. Cl.² A63F *3/00*
U.S. Cl. 273—134 AD **5 Claims**



1. A novel educational game, said game comprising, in combination:

a. A game playing area bearing a plurality of separate circuitous pathways, each said pathway bearing a plurality of separate transfer stations spaced therealong, each said transfer station bearing distinctive individual indicia,

various indicia being utilized among said transfer stations, each said pathway also including penalty stations and reward stations interspersed with said transfer stations;

b. A plurality of individual player markers for progressive movement from station to station along said pathways, each said marker being transferable from any of said pathways at any of said transfer stations to a like transfer station on another of said pathways;

c. marker movement determining means;

d. A plurality of individualized reward tokens bearing indicia corresponding to indicia at said reward stations; and,

e. A plurality of individual tally figures, each bearing a plurality of reward token-receiving means, whereby during operation of said game each tally figure can receive at least certain of said reward tokens to reflect progress towards a successful game conclusion.

3,979,122

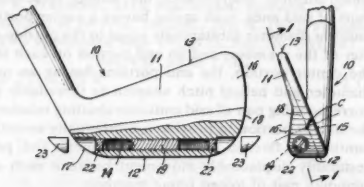
ADJUSTABLY-WEIGHTED GOLF IRONS AND PROCESSES

Peter A. Belmont, 7 White Birch Ridge, Weston, Conn. 06608

Filed June 13, 1975, Ser. No. 586,598

Int. Cl.[2] A63B *53/04*

U.S. Cl. 273—171 **9 Claims**



1. A golf iron comprising a blade containing means for adjusting the swing weight, the heel-toe balance and the lift- and distance-imparting properties thereof, said blade having a core comprising its center of gravity, a heel section and a toe section on opposite sides of said core, a relatively thin upper section extending from said toe section to said heel section above said core and a substantially thicker sole section extending from said toe section to said heel section below said core, a flat ball-engaging face surface between said heel, toe, upper and sole sections in front of said core and a rear surface between said heel, toe, upper and sole sections to the rear of said core, said iron having its greatest thickness in said sole section, a threaded cylindrical bore completely through said sole section adjacent but spaced from the undersurface of said sole section and the rear surface of said blade, said bore extending from said heel section to said toe section, below and to the rear of the core in the lower rear quadrant of the blade, and at least one threaded insert having a predetermined weight selected from a group of threaded inserts having different known weights engaged within said bore as the sole weight adjustment therein and providing said golf iron with a predetermined desired swing weight and predetermined lift- and distance- imparting properties, and located at a predetermined position within said bore to provide said golf iron with a predetermined desired heel-toe balance.

8. A process for producing a golf iron having an adjustable swing weight, an adjustable heel-toe balance and adjustable lift-and distance- imparting properties which comprises providing a golf iron having a blade having a core comprising its center of gravity, a heel section and a toe section on opposite sides of said core, a relatively thin upper section extending from said toe section to said heel section above said core and a substantially thicker sole section extending from said toe section to said heel section below said core, a flat ball-engaging face surface between said heel, toe, upper and sole sections in front of said core and a rear surface between said heel, toe, upper and sole sections to the rear of said core, said iron having its greatest thickness in said sole section, cutting a cylindrical bore completely through said sole section adjacent but spaced from the under-surface of said sole section and the rear surface of said blade, said bore extending from said heel section to said toe section, below and to the rear of the core in the lower rear quadrant of the blade, forming a thread within said bore, and screwing at least one threaded insert selected from a group of such inserts having different known weights into said bore, as the sole weight adjustment therein, the weight of said insert providing said iron with a predetermined swing weight and predetermined lift- and distance-imparting properties, and the location of said insert within said bore providing said iron with a predetermined heel-toe balance.

3,979,123

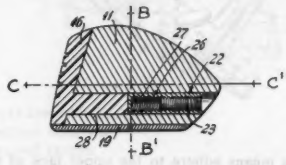
GOLF CLUB HEADS AND PROCESS

Peter A. Belmont, 7 White Birch Ridge, Weston, Conn. 06608

Continuation-in-part of Ser. No. 419,797, Nov. 28, 1973, Pat. No. 3,897,066. This application Apr. 2, 1975, Ser. No. 564,426

Int. Cl.[2] A63B *53/08*

U.S. Cl. 273—171 **6 Claims**



1. Wooden head for a golf club comprising a wooden body having a core comprising its center of gravity, heel and toe sections on opposite sides of said core a hosel located at said heel section, said feel out toe section being separated by a central vertical axis plane which intersects said core, face and rear sections on opposite sides of said core and separated by a transverse vertical axis plane which intersects said core at an angle perpendicular to said central axis and rearwardly of said hosel sole and upper sections below and above said core and separated by a horizontal axis plane which intersects said core, and at least two hollow threaded tubular chambers in said wooden body each of which is adapted to receive and threadably engage a unitary weighted closure means selected from a group of graduated, threaded weighted closure means each having a distinct known weight as the sole weight in said chambers, an equal number of said tubular chambers being located within said wooden body on opposite sides of said central vertical axis plane in said heel and toe sections, extending from said rear surface to said transverse vertical axis plane in said rear section behind and beneath said core and horizontal axis plane in said sole section and spaced from the under surface of said sole section, said tubular chambers extending parallel to each other and to the central vertical and horizontal axis planes and having their weighted closure means exposed and removable through openings in the rear surface of the wooden body, one of said weighted closure means of different known weight being threadably engaged within each of said tubular chambers to provide the desired, variable balance and swing weight of said wooden head while also providing variable delayed impact thrust to the ball being hit and variable increased lift and distance thereto.

4. Process for producing a wooden head for a golf club comprising a wooden body having a core comprising of said core, a hosel located at said heel section, said heel and toe section being separated by a central vertical axis plane which intersects said core, face and rear sections on opposite sides of said core and separated by a transverse vertical axis plane which intersects said core at an angle perpendicular to said

central axis and rearwardly of said hosel sole and upper sections below and above said core and separated by a horizontal axis plane which intersects said core, comprising the steps of boring an equal number of hollow tubular openings from the surface of said rear section to the transverse vertical axis plane in each of the heel and toe sections of said wooden body at the rear section thereof, on opposite sides of said vertical axis plane, behind and beneath said core and horizontal axis plane in said sole section and spaced from the under surface of said sole section and parallel to each other and to the central vertical and horizontal axis planes of said wooden body, providing said openings with thread means to form threaded chambers adapted to receive and threadably engage a unitary, weighted closure means selected from a group of graduated, threaded weighted closure means each having a distinct known weight as the sole weight in said chambers, said threadably engaging one of said weighted closure means of different known weight within each of said tubular chambers to provide the desired, variable balance and swing weight of said wooden head while also providing delayed impact thrust to the ball being hit and increased lift and distance thereto.

3,979,124

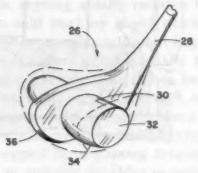
PRACTICE GOLF CLUB

Carl A. Uraneck, Rte. 3, Box 148, Bartlesville, Okla. 74003

Continuation-in-part of Ser. No. 378,682, July 12, 1973, abandoned. This application Sept. 11, 1974, Ser. No. 505,072

Int. Cl.² A63B *69/36*

U.S. Cl. 273—186 A **6 Claims**



1. A practice golf club for use as a substitute for a golf club, said golf club having a shaft, a grip at one end of said shaft, a shank at the opposite end thereof, a club head secured to the shank and having a flat base portion thereon, a front striking face provided on one side of the club head and disposed at an incline extending upwardly and rearwadly from the front edge of the base portion, a sweet-spot on said club face representing the center of percussion of the golf club when swung about an axis at the grip and having a sweet-spot area smaller than the club face and lying on said face surrounding the sweet-spot; said practice club comprising:

1. a shaft substantially identical to the shaft of the golf club,
2. a grip at one end of the shaft substantially identical to the grip of the golf club,
3. a shank at the opposite end of the shaft of the type on the golf club,
4. a practice club head having the same weight as that of the golf club head secured to the shank and having a base portion and a front striking face on one side thereof, said practice club striking face extending upwardly and rearwardly from the front edge of the base portion and being disposed at an incline and position with respect to the base portion of the practice club head substantially identical to the corresponding incline and position of the striking face of the golf club, the practice club striking face having a sweet-spot at the same position of the sweet-spot of the golf club, said practice club striking face being of a size smaller than the golf club striking face and surrounding the sweet-spot.

3,979,125

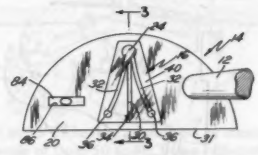
GOLF PUTTER PRACTICE DEVICE

William E. Lancellotti, 371 Broadway, Providence, R.I. 02903

Filed Nov. 10, 1975, Ser. No. 630,659

Int. Cl.² A63B *69/36*

U.S. Cl. 273—186 A **23 Claims**



1. A golf putter practice device comprising indication means including a reservoir for receipt of a liquid indicator, such as mercury, a plurality of separate liquid receiving channels converging with each other and communicating with said reservoir at adjacent points along an edge thereof, means operatively associating said reservoir and channels with the top surface of the putter wherein the reservoir is disposed toward the rear edge of the putter with the channels extending forwardly toward the ball-contacting face of the putter and being viewable by the golfer, wherein momentum transmitted to said liquid indicator during a putting stroke and upon impact with a ball serves to force liquid from said reservoir into said channels in varying amounts dependent upon the alignment of the putter face and the ball during impact.

3,979,126

BALL AND PROCESS AND COMPOSITION OF MATTER FOR PRODUCTION THEREOF

Warren M. Dusbiber, Plymouth, Mich., assignor to Acushnet Company, New Bedford, Mass.

Continuation-in-part of Ser. No. 110,313, Jan. 27, 1971, abandoned, which is a continuation-in-part of Ser. No. 856,890, Sept. 2, 1969, abandoned, which is a continuation of Ser. No. 434,227, Feb. 23, 1965, abandoned. This application Jan. 10, 1973, Ser. No. 322,296

Int. Cl.² A63B *37/00*; **C08K** *5/11*, *5/12*; **C08L** *75/08*

U.S. Cl. 273—218 **14 Claims**

1. A polyurethane golf ball having the following physical characteristics:

Diameter	less than 1.70 inches
PGA Compression	at least 25
Hardness Shore "C" Scale	at least 60
Rebound 72 Inch	at least 48 inches
Initial Velocity USGA	at least 230 feet/second

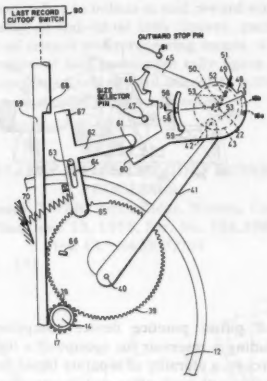
prepared from the composition comprising a prepolymer of a polyether and a diisocyanate and a curing agent selected from the group consisting of trifunctional and tetrafunctional polyols and curing agents capable of curing the prepolymer and having at least two reactive amine groups, the prepolymer and the curing agent being present in an equivalent weight ratio of 1:1 ± 20%.

3,979,127

RECORD PLAYERS

Daniel McLean McDonald, 28 Chemin de Bellefontaine,, 1223 Cologny, Geneva, Switzerland

Filed Jan. 23, 1975, Ser. No. 543,267
Claims priority, application United Kingdom, Jan. 31, 1974, 4555/74
Int. Cl.[2] G11B 15/00
U.S. Cl. 274—10 R 13 Claims



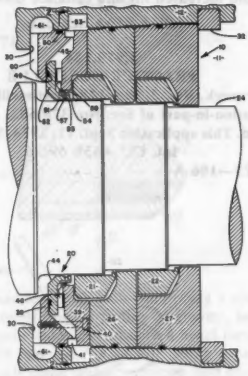
1. An automatic record player for playing disc records of different sizes comprising,
a deck plate,
a turntable rotatably mounted on said deck plate,
a centre spindle extending upwardly from the centre of said turntable from which records are fed singly in succession from a bottom of a stack onto said turntable,
a vertical spindle pivotally mounted for movement about a vertical axis relative to said deck plate,
a pick-arm pivotally mounted for movement about a horizontal axis on the upper end of said vertical spindle,
a drive gear rotatably mounted on said deck plate,
means for rotating said drive gear during a record changing cycle,
automatic mechanism for raising and lowering said pick-up arm for pivoting said pick-arm inwardly and outwardly relative to said turntable,
said automatic mechanism including,
a first reciprocatably rotatable memeber,
means driven from said drive gear to reciprocatably rotate said first member;
a cam track on said first member engaged by a pick-up arm raising spindle to raise and lower said pick-up arm,
a second reciprocatably rotatable member,
a torque limiting means to releasably connect said second member to said first member to be rotated thereby, said torque limiting means mounted to releasably interconnect said first and second members at determined angular displacements,
an element connected to said vertical spindle,
spring means provided on said first member, said spring means being positioned to apply torque to said element to thereby rotate said vertical spindle in a direction to move said pick-up arm outwardly relative to said turntable, and an abutment on said first member positioned to limit the angular movement of said spring means,
stop means positioned to arrest outward movement of said pick-up arm in a predetermined position,
an abutment fixed relative to said second member adapted to engage said element to rotate said vertical spindle in the opposite direction, and
further stop means to arrest rotation of said second member when said pick-up arm is in a predetermined position,
the torque required to disconnect said torque limiting means being greater than the torque applied by said spring means to said element.

3,979,128

INTERFACE BUSHING FOR FLUID-TO-FLUID SHAFT SEAL ASSEMBLY

Carl H. Geary, Greensburg, Pa., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 3, 1975, Ser. No. 619,326
Int. Cl.[2] F16J 15/44
U.S. Cl. 277—75 3 Claims



1. An assembly for supporting a bushing seal within a rotary machine and establishing a positive fluid seal about the machine shaft to prevent working fluids from escaping about the shaft, the assembly including
a first ring adapted to loosely encompass the shaft and being positionable to confront the working fluids located within the machine,
a second ring also adapted to loosely encompass the shaft and being positioned behind said first ring in regard to the working fluids,
said first and second rings having opposed contoured radially extended faces for providing an annular opening therebetween when said rings are brought into abutting contact,
an annular bushing seal having a portion thereof adapted to encircle the shaft with a close running fit therebetween, said portion being dependent upon a radially extended arm arranged to pass upwardly into the annular opening formed between the two rings,
means to secure the two rings in abutting contact with the bushing arm extending into the annular opening,
a wave washer positioned between one wall of the annular opening and the radial arm of the bushing for exerting a perpendicular biasing force against the bushing arm to permit said bushing to move radially with the shaft as the shaft deflects under load when the rings are secured in abutting contact,
means to bring a sealing fluid into the annular opening whereby the fluid is directed downwardly through said opening.

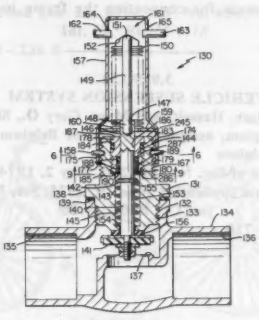
3,979,129
VALVE CONSTRUCTION AND IMPROVED PARTS FOR THE SAME OR THE LIKE

Edward N. Caldwell, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 405,130, Oct. 10, 1973, Pat. No. 3,884,587, and a continuation-in-part of Ser. No. 290,558, Sept. 20, 1972. This application Mar. 7, 1975, Ser. No. 556,277

Int. Cl.[2] F16J *15/18*

U.S. Cl. 277—110 **2 Claims**



1. In a control device having a packing gland and a movable valve stem or the like passing through said packing gland to be sealed thereto while moving axially relative thereto, the improvement wherein said packing gland carries two resilient O-rings separated by an annular lubricant impregnated packing material, said valve stem passing axially through said O-rings and said annular packing material to be sealed thereby while being axially movable relative thereto, said O-rings and said annular packing material being disposed in stacked and compressed relation, said packing gland having opposed ends interrupted by a stepped bore passing through said packing gland and defining an annular shoulder in said packing gland, one of said O-rings being disposed in stacked compressed relation against said shoulder, and a washer completely disposed within said bore and being disposed against the other O-ring to hold said O-rings and said packing material in said stacked and compressed relation in said packing gland.

3,979,130
SLEEVES

George Raymond Cowie, Middlesbrough, England, assignor to Fisons Limited, London, England

Continuation of Ser. No. 435,009, Jan. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 264,068, June 19, 1972, abandoned. This application July 31, 1975, Ser. No. 600,852

Claims priority, application United Kingdom, June 18, 1971, 28626/71

Int. Cl.[2] F16L *19/00*; F16J *9/00*

U.S. Cl. 277—208 **9 Claims**

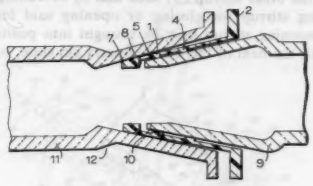
1. In an open ended conical sleeve member having a wall thickness of from 0.1 to 1.5 mm and suitable for use as a sealing interface between the co-operating mating surfaces of a tapered male/female push fit type glassware joint, the improvements which comprise:

said sleeve having a substantially smooth exterior surface;

at least two generally circumferential ribs integral with the interior surface of said sleeve member;

an external integral annular flange positioned at the broader end of said sleeve member and extending radially outwardly therefrom, whereby said sleeve member may be gripped during assembly and dismantling of a joint incorporating the sleeve member;

said sleeve member, said generally circumferential ribs and said annular flange being constructed from a material having a static coefficient of friction of less than 0.2, having a modulus of elasticity in the range of 80×10^3 to



200×10^3 at 23°C, having a hardness as measured on the Shore D scale of from 50 to 80, being resistant to thermal degradation at temperatures up to 200°C and being resistant to structural degradation when immersed in a corrosive chemical for a period of 12 hours at 50°C.

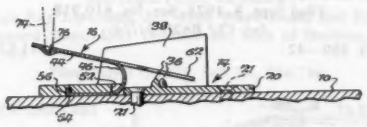
3,979,131
SKI BINDING

George E. Ginther, 432 Porter Ave., Buffalo, N.Y. 14201

Filed Mar. 18, 1975, Ser. No. 559,540

Int. Cl.[3] A63C *9/10*

U.S. Cl. 280—615 **10 Claims**



1. A binding for touring skis comprising:

a. a toe plate element adapted to be fixed to a touring ski for receiving the toe portion of the boot of a skier, said toe plate comprising a base and a pair of upstanding side walls each having generally planar and vertical inner surface portions; and

b. a toe spring clamp element operatively associated with said toe plate element and having a pair of spaced apart arms for clampingly engaging the skier's boot along the sides of the toe portion thereof, said arms being entirely inwardly of said inner surface portions of said walls and being movable freely with respect to said walls, said clamp element comprising a unitary bail spring element having a planar main body portion, means on said body portion permitting operative engagement by an end of a ski pole to operate said clamp, a central leg portion extending from one end of said main body portion and out of the plane of said body portion, said leg portion being fixed to said toe plate element, and said arms of said clamp element extending from said one end of said body portion on opposite sides relative to said central leg portion, said arms being disposed in the plane of said body portion.

3,979,132
HEEL BINDING FOR CROSS COUNTRY SKIS

Herbert Iser-Iser, Teufelsbergstrasse 8, 8000 Munich 60, Germany

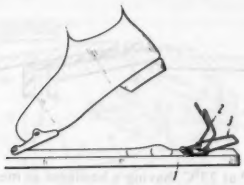
Filed Sept. 5, 1975, Ser. No. 610,744

Int. Cl.[3] A63C *11/12*

U.S. Cl. 280—614 **10 Claims**

1. A heel binding for a cross-country ski comprising:

two swivel mounted stirrups (2,3) each pivotally mounted about an axis transverse to said ski and arranged parallel and some distance apart, one (2) of said stirrups being a tensioning stirrup which is guided and operated by means of the other stirrup (3) such that by swivelling said operating stirrup for closing or opening said binding, said tensioning stirrup may be brought into positive contact with the heel of the cross-country ski shoe, or released;



said operating stirrup being mounted in front of said tensioning stirrup in the direction of travel of said ski; and

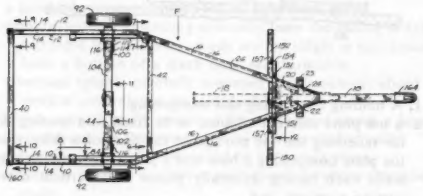
eye-type guide means (10′) fixed to the sides (3′, 3″) of said operating stirrup and operatively engaging the sides (2′, 2″) of said tensioning stirrup so as to guide and operate said tensioning stirrup.

3,979,133

FOLDABLE TRAILER

William E. Morris, Appleton, Wis., assignor to Spec-Co Industries, Inc., Appleton, Wis.

Filed Sept. 8, 1975, Ser. No. 610,918
Int. Cl.² B62D *21/14*
U.S. Cl. 280—42 **11 Claims**



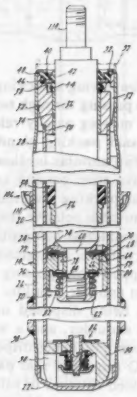
1. A foldable trailer comprising a frame assembly which includes a pair of rigid side frame members in which each member of the pair is pivotally mounted for rocking movement in a horizontal plane about their forward end portions between folded and unfolded positions of adjustment, said side frame members having a rearward portion which extends in spaced parallel relation and a forward portion which extends angularly in the direction towards each other to converge towards the longitudinal center line of the frame, a tail gate pivotally mounted at one end to the rearward end portion of one of the side frame members for rocking movement between folded and unfolded position, and means releasably latching the other end portion of the tail gate to the rearward end portion of the other of the side frame members when in unfolded position, at least one mid cross brace member pivoted at one end to a mid portion of one of the side frame members for rocking movement in a horizontal plane between folded and unfolded positions and means releasably latching the other end of the mid cross brace member to the other side frame member when in unfolded position to extend crosswise between the side frame members, an axle assembly subdivided into segments including a pair of outer segments and a pair of inner segments, means supporting the outer segments from the outer side frame members, means pivotally mounting the outer ends of the inner segments to the inner segments to the inner ends of the outer segments for rocking movement of the inner segments relative to the outer segments about a horizontal plane and means pivotally interconnecting the inner ends of the inner segments for relative rocking movement about a horizontal plane between folded and unfolded positions of adjustment, and latching means for releasably locking the inner segments against pivotal movement from unfolded position with the segments extending crosswise of the frame, wing members pivotally mounted to the forward end portion of the side frame members for rocking movement about a horizontal plane between spread and folded positions of adjustment, and means for releasably latching the wing members in unfolded position to extend outwardly from the side frame members, and tongue means for connecting the frame to a powered vehicle.

3,979,134

VEHICLE SUSPENSION SYSTEM

Johan H. Keijzer, Hasselt, and Maes, Gery O., Sint-Truiden, both of Belgium, assignors to Monroe Belgium N.V., Sint-Truiden, Belgium

Continuation of Ser. No. 466,230, May 2, 1974, Pat. No. 3,893,702. This application June 19, 1975, Ser. No. 588,360
Int. Cl.² B60G *11/26*
U.S. Cl. 280—710 **21 Claims**



1. A vehicle suspension system for use in operatively supporting the road engaging wheels on an automotive vehicle,

said suspension including at least one suspension strut comprising an elongated tubular pressure cylinder,

a valved piston reciprocably disposed in said cylinder and connected to one end of a piston rod extending axially from one end of said cylinder,

attachment means operatively securing one end of said piston rod to a sprung portion of the associated vehicle,

a rod guide disposed at one end of said pressure cylinder for supporting said piston rod for reciprocal movement relative to said cylinder.

an elongated reserve tube extending concentrically around said pressure cylinder,

said reserve tube being spaced radially outwardly from said pressure cylinder and defining a fluid reservoir therewith,

a base valve located at the opposite end of said pressure cylinder from said rod guide and operable to control fluid flow between the interior of said pressure cylinder and said reservoir,

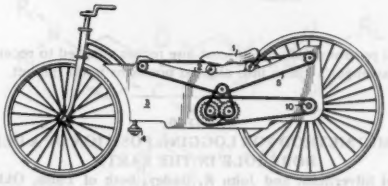
a wheel spindle located adjacent one end of said strut and including a first portion fixedly secured to the outer periphery of said reserve tube and a second portion removably secured to said first portion and adapted to support a vehicle wheel thereon,

the end of said reserve tube adjacent said rod guide extending axially beyond the axially outer end of said guide, with the terminal portion thereof being deformed radially inwardly over at least a portion of the axially outer side of said guide.

3,979,135
VEHICLE PROPELLED BY RECIPROCATING OCCUPANT MOTION

Athanassios N. Meritzis, 666 Coronado Ave., Long Beach, Calif. 90814

Filed Jan. 21, 1974, Ser. No. 434,796
Int. Cl.² B62M *1/18*
U.S. Cl. 280—226 R **2 Claims**



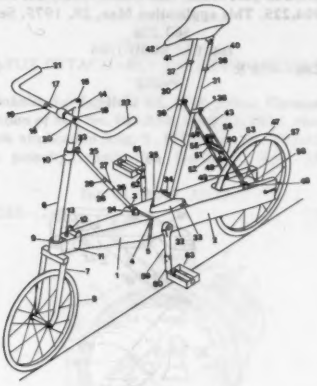
1. A vehicle comprising a frame supported by wheels rotatively mounted with a movable seat sliding on the curved rails of the said frame and adapted to be reciprocated by the rider's force and a motion transmission mechanism comprising:
   a. A pair of freewheels mounted on separate and parallel shafts on bearings and turning with a chain attached by its two ends to the sliding seat.
   b. A pair of intermeshed spurgears attached to the same shafts with the freewheels such that, in combination, a forward propulsion may be achieved by both forward and reverse occupant motion.
   c. A chainwheel attached to the extension of one of the two shafts supporting the freewheels and the spurgears which transmits the motion with another chain to the rear wheels supporting the vehicle.
   d. A plurality of loose and fixed sprockets used for directing the motion of the chains and for turning the different shafts of the mechanism.

3,979,136
FOLDABLE BICYCLE

Alan Lassiere, Leatherhead, England, assignor to A. Lassiere Ltd., Leatherhead, England

Filed Dec. 16, 1974, Ser. No. 533,009
Claims priority, application United Kingdom, June 3, 1974, 24472/74
Int. Cl.² B62K *15/00*
U.S. Cl. 280—278 **14 Claims**

1. A portable foldable bicycle comprising a main frame divided into a front frame part and a rear frame part which are hingedly connected together, a front fork and a steering assembly hingedly connected to the front frame part, a saddle supporting assembly hingedly connected to the rear frame part, and locking means provided in operative association with each of the hinged connections, and in which the front and rear parts of the main frame are of generally box shaped cross section and a hinge pin is arranged adjacent one side thereof to permit the two parts to be positioned side by side in the folded position and including a foldable front stay which is hingedly connected at its ends to the front tube and to the rear end of the front frame part, and in which adjacent inner ends of the front stay are hingedly interconnected and a spring

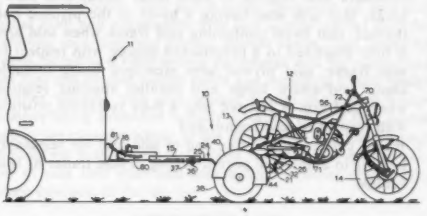


loaded sleeve coacting with a collar is provided to lock the stay in an in line position.

3,979,137
MOTORCYCLE TRAILER

Orange Ray Lipscomb, Jr., 4308 Ward Road, and Edward Bernard Sales, 4501 Denfield St., both of Durham, N.C. 27704

Filed July 17, 1975, Ser. No. 596,756
Int. Cl.² B60P *3/06*
U.S. Cl. 280—402 **10 Claims**



1. A trailer for towing behind a towing vehicle a motorcycle having front and rear wheel means, a handle bar, and a foot peg, comprising in combination:
   a. a frame;
   b. a pair of trailer wheels attached to said frame for supporting said frame above the road surface;
   c. a curved channel cradle secured to said frame for horizontal pivotal movement, said cradle comprising an arc-like portion having channel sidewalls and a peripheral curvature approximating the curvature of said motorcycle wheels and having a width between said sidewalls sufficient to receive a selected motorcycle wheel;
   d. means on said cradle for securing said selected motorcycle wheel within said cradle;
   e. a draw bar attached at one end to said frame and adapted to be removably attached at the other end to said towing vehicle; and
   f. rigid connecting means releasably secured at one end to said handle bar and at the other end to said foot peg, said connecting means holding said handle bar in a fixed position during towing.

3,979,138

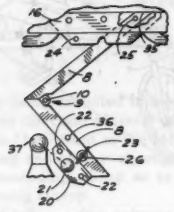
ADJUSTABLE TRAILER HITCH

Jimmie George, P.O. Box 212, and Charles P. Tyson, P. O. Box 191, both of Mer Rouge, La. 71261

Continuation-in-part of Ser. No. 492,679, July 29, 1974, Pat. No. 3,904,225. This application Mar. 28, 1975, Ser. No. 563,216

Int. Cl.² B60D 1/06

U.S. Cl. 280—478 R 9 Claims



1. An adjustable trailer hitch comprising:

a. a frame capable of being mounted on a vehicle;

b. an arm pivoted to said frame at one end thereof and having an elbow hinge intermediate the ends thereof dividing said arm into a pair of pivotal arm members movable about said elbow hinge and bevelled to permit a predetermined degree of extension of said pivotal arm members with respect to each other about said elbow hinge, said arm also having a bevel at the pivoted end thereof, said bevel contacting said frame when said arm is fully extended to a preselected degree with respect to said frame, said pivotal arm members being foldable about said elbow hinge into parallel abutting relation when said arm is pivoted into a fully retracted position with respect to said frame; and

c. means carried by the free end of said arm for releasably locking to a trailer to permit towing of said trailer by said vehicle.

3,979,139

SAFETY DEVICE HAVING A CONTOURED ENERGY ABSORBING IMPACT ELEMENT

Gunter Hoffmann, Gifhorn; Wilfried Kopke, Sulfeld, and Rudiger Weissner, Fallersleben, all of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

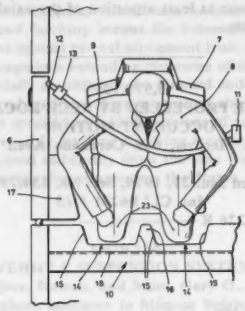
Filed Jan. 31, 1975, Ser. No. 545,967

Claims priority, application Germany, Feb. 15, 1974, 2407178

Int. Cl.² B60R 21/02

U.S. Cl. 280—751 12 Claims

1. A safety device for a passenger in a vehicle comprising means for restraining an upper portion of the passenger's body relative to a vehicle seat and impact energy absorbing means disposed on the vehicle in a zone adjacent the knees of the passenger when seated in the vehicle seat and having a configured impact surface presented to the passenger's knees for guiding the knees of the passenger, when impacting on the energy absorbing means, into positions in which the passenger's thighs are aligned generally parallel to the longitudinal axis of the vehicle, wherein said configured impact surface includes a frontal impact portion and lateral guiding portions leading in toward the frontal impact portion, said frontal and



lateral portions defining at least one recess adapted to receive the passenger's knees into aligned positions upon impact.

3,979,140

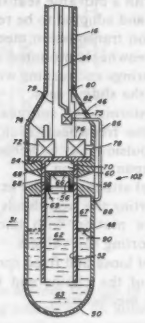
SEISMIC METHOD FOR LOGGING POSITION OF A DEEP BOREHOLE IN THE EARTH

Daniel Silverman, and John R. Bailey, both of Tulsa, Okla., assignors to Senturion Sciences, Inc., Tulsa, Okla.

Filed June 3, 1974, Ser. No. 475,589

Int. Cl.² G01V 1/40

U.S. Cl. 181—120 16 Claims



1. Apparatus for seismic logging of the position of a deep borehole in the earth at least partially filled with liquid, comprising:

a. a plurality of ground motion sensors positioned in a two dimensional array on the earth about said boreholes, and means to amplify and record the output signals of said sensors;

b. a long continuous pipe and means for inserting the free end of said pipe into the mouth of said borehole and lowering it to selected depth in said borehole and means for determining the length of said pipe in said borehole;

c. means for introducing a fluid under high pressure into the surface end of said pipe, whereby said pipe will be filled with said pressurized fluid;

d. chamber means on the lower end of said pipe for storing said pressurized fluid the pressure of said pressurized fluid being greater than the pressure in said liquid in said borehole;

e. means for suddenly opening said chamber to the liquid in said borehole in the vicinity of said chamber; and

f. means for determining the time instant of said opening.

3,979,141

PRESSURE-SENSITIVE RECORDING SYSTEM COMPRISING 3'-AMINO-6' OR 7'-(PYRAZOL-1-YL)FLUORAN COMPOUNDS AS COLOR PRECURSORS

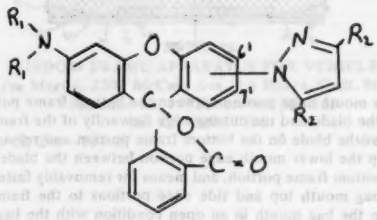
Derek J. Alsop, North Tonawanda, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Division of Ser. No. 525,991, Nov. 21, 1974, Pat. No. 3,929,828. This application July 9, 1975, Ser. No. 594,287

Int. Cl.² B41M 5/22

U.S. Cl. 282—27.5 4 Claims

1. In a pressure-sensitive recording system comprising a layer containing a substantially colorless color precursor compound and a layer of an electron-acceptor material, the improvement which comprises utilizing, as said color precursor compound, a chromogenic 3'-amino-(pyrazol-1-yl) fluoran compound having the following structural formula:



wherein each R_1 represents either a hydrogen atom or a lower alkyl group having from one to five carbon atoms; wherein each R_2 represents either a hydrogen atom, a lower alkyl group having from one to five carbon atoms or a phenyl group; and wherein the pyrazol group is attached to the fluoran moiety at either the 6' position or the 7' position of the latter.

3,979,142

ABRASION RESISTING FLEXIBLE JOINT PIPE

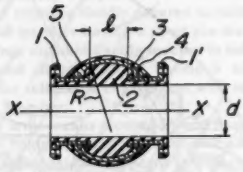
Masao Fujisawa, Chigasaki, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 17, 1974, Ser. No. 533,592

Claims priority, application Japan, Dec. 21, 1973, 48-142498; Dec. 21, 1973, 48-142499

Int. Cl.² F16L 21/00

U.S. Cl. 285—235 3 Claims



1. An abrasion resisting joint pipe comprising a pair of opposed end tubes separated from each other and aligned with a common center axis, an elastic rubber body extending across and flexibly holding together said end tubes and defined by a cylindrical inner rubber surface and a spherical shell-shaped outer rubber surface, and a spherical shell-shaped reinforcing layer comprised of at least two rubberized cord fabrics embedded in said elastic rubber body and bound at each end about said end tubes, said flexible joint pipe satisfying the condition given by

$$l < 0.68d$$

where l is the distance between said opposed end tubes and d is the inner diameter of said end tube.

3,979,143

DEVICE FOR DETACHABLY FASTENING HOSE OR PIPE ENDS

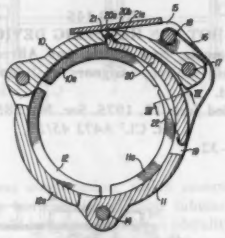
Karl Weinhold, Im Jagdfeld 43, 4040 Neuss, Germany

Continuation of Ser. No. 463,034, April 22, 1974, abandoned. This application Aug. 8, 1975, Ser. No. 603,018

Claims priority, application Germany, Apr. 25, 1973, 2320815

Int. Cl.² F16L 33/12

U.S. Cl. 285—243 7 Claims



1. A device for releasable attachment of the ends of hoses and pipes comprising at least two partial shells having a radial flange at each edge and means pivotally connecting, said partial shells together, clamping means for clamping said partial shells together, said clamping means including a first peripheral lock for connecting a first and a second of said partial shells, said first lock including a clamping lever hinged to said first partial shell and a spring mounted on said first partial shell and engageable with said second partial shell for clamping said first and second partial shells, said clamping means including a rigid second peripheral lock for connecting said first and second partial shells and including a rigid bridge member integral with said second partial shell, said bridge member being extended radially inwardly of said first partial shell in the closed position of the device, and abutment means on said first partial shell and bridge member for rigid connection of said first shell and said bridge member in the fully closed position of the device.

3,979,144

LUGGAGE BOOT LID LOCK FOR MOTOR VEHICLE

Jacques Bascou, Boulogne-Billancourt,(Hauts de Seine, France, assignor to Regie Nationale des Usines Renault and Automobiles Peugeot, both of Paris, France

Filed Apr. 10, 1975, Ser. No. 566,702

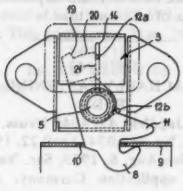
Claims priority, application France, Apr. 11, 1974, 74.12833

Int. Cl.² E05C 3/16

U.S. Cl. 292—216 7 Claims

1. A lock comprising, in combination, a support, a pivot pin mounted on said support, a keeper, a locking hook pivotally mounted on said pivot pin for pivotal movement between a locking position in locking engagement with said keeper and an unlocking position, a pair of stop members on said hook, a spring for yieldingly urging said hook pivotally in one direction, said spring having an arm arranged for limited flexible movement on said support towards and away from said pivot pin, manual control means engageable with said spring arm for moving said spring arm flexibly a selected distance with respect to said pivot pin, said spring arm being movable into one position for engagement with one of said stop members on

said hook to maintain said hook in said unlocking position and said spring arm being movable into a second position for



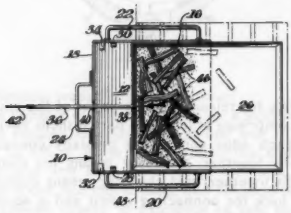
engagement with the other of said stop members to maintain said hook in said locking position.

3,979,145

HOT PAN HANDLING DEVICE

A. Harry Clemente, New Castle, and Alfredo A. Clemente, Newark, both of Del., assignors to Jumpan Corporation, Newark, Del.

Filed June 10, 1975, Ser. No. 585,768
Int. Cl.² A47J *45/10*
U.S. Cl. 294—32 **3 Claims**



1. A combination of a hot pan handling device and a push-pull bar for pushing and pulling hot pans off of and onto the handling device, the handling device comprising a bottom wall of sheet-like material with opposite side walls and a single front end wall of sheet-like material integrally connected thereto and extending upwardly therefrom to thereby provide the handling device with an open back, a cut-out portion approximately located in the mid portion of the front end wall and open at the upper boundary of that wall, a side handle connected to each of the opposite side walls and extending generally upwardly therefrom, a front end handle connected to the front end wall and extending generally upwardly therefrom whereby a hot pan may be manipulated onto the bottom wall of the handling device by way of the open back thereof and transported by lifting the side handles, and the push-pull bar having a downturned end for manipulating hot pans with a substantially flat element at the opposite end of the bar for prying hot pans upwardly to facilitate positioning the handling device thereunder, and the cut-out portion in the front end wall of the handling device cooperating with the push-pull bar for guiding and supporting the bar during the pan manipulation operation.

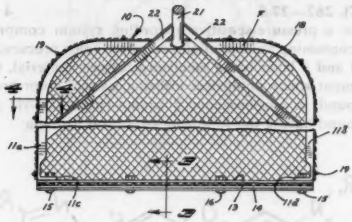
3,979,146

BEACH CLEANING APPARATUS

Robert M. Berg, 5250 James Ave. No., Minneaolis, Minn. 55430

Filed June 19, 1975, Ser. No. 588,321
Int. Cl.² A01B *1/02*
U.S. Cl. 294—55 **7 Claims**

1. A tool for cleaning debris and litter from beaches and the like as it is pulled in a forward direction comprising an open, upright, generally rectangular frame having a top frame portion and a bottom frame portion, a manually pullable handle having one end portion secured to the top frame portion to extend upwardly and forwardly thereof, a blade having a front cutting edge, an open mesh collapsible bag having a mouth edge portion, said mouth edge portion having a lower mouth edge portion extended between the bottom frame portion and the blade, and top and side edge portions, means for removably securing the blade to the bottom frame portion with the



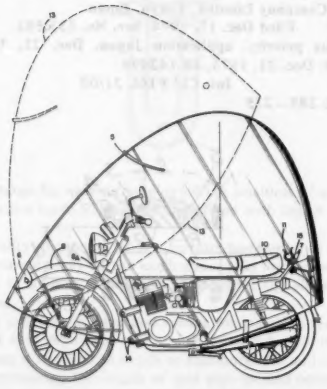
lower mouth edge portion between the bottom frame portion and the blade and the cutting edge forwardly of the frame to mount the blade on the bottom frame portion and releasably clamp the lower mouth edge portion between the blade and the bottom frame portion, and means for removably fastening the bag mouth top and side edge portions to the frame to retain the bag mouth in an open condition with the bag extending rearwardly of the frame in a collapsed condition.

3,979,147

TRANSPARENT COVER WITH CONNECTING DEVICES FOR MOTORCYCLES AND RIDERS

Robert F. Kelley, 247 Humphrey St., Marblehead, Mass. 01945

Filed Mar. 14, 1975, Ser. No. 558,552
Int. Cl.² B62T *17/00*
U.S. Cl. 296—78.1 **2 Claims**



1. A full Cover, providing cosmetic and weather protection for motorcycle and riders at rest or in motion, comprising:

a rigid, transparent, thermoplastic, semidomed shaped full Cover of sufficient size to cover a motorcycle with rider;

said Cover containing a struct-brace, running laterally within the interior of the Cover, which struct-brace is attached at its ends to the interior side surfaces of the Cover at its rearward portion, which struct-brace engages and disengages the topmost clamp of

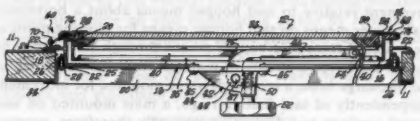
a Rear Connecting Device, consisting of two pressure clamps attached head-to-head of which the bottommost clamp is attached to a standard grab-bar of a motorcycle thus providing a rearward attachment and stabilization device to coincide with

a Front Connecting Device consisting of a goose-necked shaped tube, oval in cross-section, which tube is attached, by means of clamps, at its rear lower end to the frame of a motorcycle directly in front of the motorcycle's engine; such tube projects forward through and between the space between the front forks of the motorcycle's front wheel; the tube arcs to a point above and forward of the front wheel, at which point the tube is connected via a swivel arrangement to a knob, which knob is also attached to the front interior surface of the aforementioned Cover, thus allowing the Cover to be raised or lowered for rider entry or exit while a motorcycle with Cover is at rest.

3,979,148
WINDOW FRAME APPARATUS FOR VEHICLES

Wayne Martin, 2301 McCart Ave., La Habra, Calif. 90631

Filed June 12, 1975, Ser. No. 586,158
Int. Cl.² B60J 7/08
U.S. Cl. 296—137 B 4 Claims



1. A window frame apparatus for use in a vehicle, comprising:

a window casement fixedly secured in an aperture disposed in said vehicle;

a window unit operably connected to said casement having a glass panel mounted therein, said unit including an inner peripheral track;

a hinge means releasably connecting said window unit to said window casement along one side thereof, wherein said hinge means comprises:

a first hinge member fixedly secured to said window casement, said member having a pivot pin mounted thereto;

a second hinge member fixedly secured to said window unit, said second hinge member having a tongue member adapted for releasable engagement with said pivot pin of said first member;

an operably lever means secured to said fixed window casement and being operably engaged with said track means for disengaging said lever means therefrom, whereby said hinge means can be separated to allow said window unit to be disengaged from said window casement, wherein said operable lever means comprises:

a housing fixedly secured to said window casement;

an adjustable lever arm having one free end and the opposite end thereof pivotally mounted in said housing;

a roller attached to said free end of said arm and removably received in said track of said window unit;

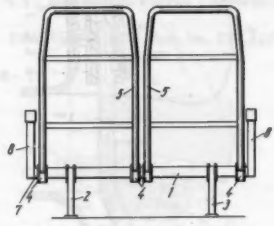
gear means disposed in said housing and operably connected to the pivotal end of said lever arm; and

disengaging means disposed in said track comprising a slot positioned in said track whereby said roller of said lever means can be disengaged from said track when said window unit is raised to a predetermined point.

3,979,149
VEHICLE SEAT

Heiner Vogel, Karlsruhe, Germany, assignor to Ignaz Vogel GmbH und Co. KG, Karlsruhe, Germany

Filed Aug. 20, 1974, Ser. No. 498,933
Claims priority, application Germany, Aug. 20, 1973, 2341981
Int. Cl.² A47C 15/00
U.S. Cl. 297—232 4 Claims



1. A light seat construction, which comprises a support frame having a horizontal polygonal tubular member with opposite side walls in vertical planes, a plurality of seat means mounted on said polygonal torsion member with the central vertical plane through said polygonal torsion member passing through the center of said seat means, each seat means having a pair of connecting means fixed below said seat means in a central transverse vertical plane of said seat means, each of said connecting means being substantially an inverted U-shaped bracket member complementary to said polygonal torsion member and having its vertical sides closely fitting the vertical side walls of said polygonal torsion member and having clamping means below said polygonal torsion member clamping the sides of said connecting means against said polygonal torsion member, and an end unit comprising a tubular arm rest supporting member and a slotted tube section extending at right angles to said supporting member and into the end of said polygonal tubular torsion member, and a tapered member fitting into the slotted end of said tube section, a threaded clamping member extending from said arm rest supporting member through said tube section and engaging said tapered member for drawing said tapered member into said tube section to clamp said tube section to said polygonal torsion member.

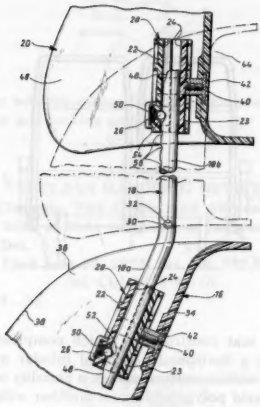
3,979,150
CHAIR HAVING A VERTICALLY ADJUSTABLE HEADREST

Manfred Elzenbeck, Steinheim, Germany, assignor to August Froscher K.G., Germany

Filed Apr. 15, 1975, Ser. No. 568,275
Claims priority, application Germany, Apr. 23, 1974, 2419483
Int. Cl.² A47C 1/10
U.S. Cl. 297—410 19 Claims

1. In a chair having a backrest and a vertically adjustable and removable headrest, means for adjustably and removably mounting said headrest on said backrest comprising two parallel struts extending downwardly from said headrest, guide means on said backrest having guide apertures receiving said struts, said struts being longitudinally slidable and also rotatable in said guide apertures and having on one side of a lower portion of each strut a transverse groove, said guide means comprising spring pressed detents engageable in said grooves in said struts when said struts are in one angular position and disengaged from said grooves when said struts are in another

angular position, whereby said detents are disengageable from said grooves by rotation of said struts for longitudinal move-



ment of said struts in said guide members for removal of said headrest from said backrest.

3,979,151

ROCK EXCAVATING ARCHED TUNNEL FORMING MACHINE

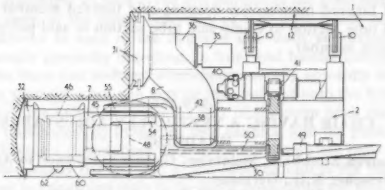
Derek Plummer, Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Feb. 13, 1975, Ser. No. 549,725

Claims priority, application United Kingdom, Mar. 1, 1974, 9330/74

Int. Cl.² E21C *29/00*

U.S. Cl. 299—31 **11 Claims**



5. A rock excavating machine for forming arch type underground roadways, comprising a body for arrangement in the underground roadway, a first forwardly extended forked support member on the body, a stay unit anchorable in the roadway, advancing ram means for interconnecting the body to the stay unit, a roof support assembly carried by the body, a forwardly extending large cutter carrying arm pivotally mounted on said forked support members for movement about a generally vertical axis and an upwardly extending large cutter carrying arm pivotally mounted on the body for movement about generally horizontal axis.

3,979,152

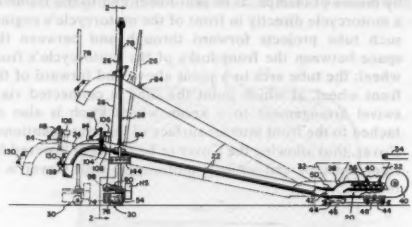
PARTICULATE MATERIAL HANDLING APPARATUS

Norval K. Morey, Winn, and Leward N. Smith, Remus, both of Mich., assignors to Morbark Industries, Inc., Winn, Mich.

Filed Nov. 22, 1974, Ser. No. 526,126

Int. Cl.² B65G *53/52*

U.S. Cl. 302—17 **5 Claims**



1. Material handling apparatus for receiving particulate material, such as wood chips or the like, from a material source and discharging a stream of the particulate material toward a selected location, said apparatus comprising a first carriage mounted for limited movement along a first path, material receiving hopper means mounted upon said first carriage for pivotal movement relative to said first carriage about a vertical axis, an elongate rigid discharge tube operatively coupled at one end to said hopper means for pivotal movement relative to said hopper means about a horizontal axis, blower means on said hopper means for blowing particulate material from said hopper means through said discharge tube to discharge a stream of material from the other end of said discharge tube, a second carriage mounted for movement independently of said first carriage, a mast mounted on said second carriage and projecting upwardly therefrom, support means supporting the other end of said tube from said mast for free vertical and horizontal movement relative to said mast, power means for driving said second carriage in movement relative to said first carriage, and steering means for controlling the direction of movement of said second carriage.

3,979,153

MASTER CYLINDER ASSEMBLIES FOR VEHICLE HYDRAULIC BRAKING SYSTEMS

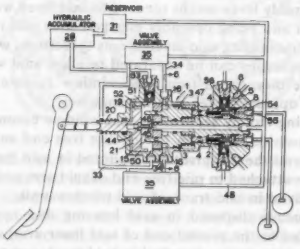
Brian Ingram, Balsall Common, and David Anthony Harries, Shirley, both of England, assignors to Girling Limited, Birmingham, England

Continuation of Ser. No. 424,887, Dec. 14, 1973, abandoned. This application Aug. 5, 1975, Ser. No. 601,994

Claims priority, application United Kingdom, Mar. 31, 1973, 15597/73; Dec. 15, 1972, 57887/72

Int. Cl.² B60T *8/02, 15/02*

U.S. Cl. 303—6 R **2 Claims**



1. In an anti-skid braking system for a vehicle comprising brakes on wheels of the vehicle, a source of booster fluid

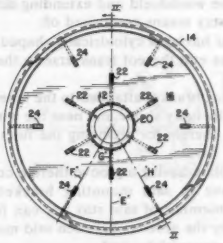
under pressure, a first reservoir for fluid for said source, a master cylinder assembly responsive to said source of booster fluid to apply said brakes, and skid sensing means for providing a signal when at least one of said wheels skids during application of said brake on that wheel, said master cylinder assembly comprising a housing, a booster valve assembly for controlling flow of fluid from said source to a booster chamber in said housing, at least two master cylinder pistons working in separate first bores in said housing to generate hydraulic fluid pressure in pressure spaces for connection to said wheel brakes and defined in said bores ahead of said pistons, normally open valves controlling communication between said pressure spaces and at least one second reservoir, said valves being closed when said master cylinder pistons are advanced in said bores, modulator pistons corresponding in number to said master cylinder pistons working in separate second bores in said housing, means for applying from each modulator piston an operating force to the one master cylinder piston with which it corresponds to advance the said one master cylinder piston in said first bore, valve housings corresponding in number to said master cylinder pistons and each having ports connected respectively to said booster chamber, said modulator piston and the reservoir for said source of fluid pressure, a solenoid operated valve in each of said housings normally occupying a first position connecting the booster chamber port and modulator port while disconnecting the latter and said reservoir port but being movable to a second position disconnecting said booster chamber port and said modulator port while connecting the latter and said reservoir port, and means for actuating said solenoid operated valve to move it from its first normal position to its second position to reduce the force on said modulating piston by relieving the pressure fluid acting thereon to the reservoir for said source of fluid pressure in response to a signal from said skid sensing means when a wheel on which the brake is being applied through said modulator piston skids.

3,979,154

TRACK WHEEL FOR CRAWLER TYPE VEHICLES

Eugene R. Groff, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 14, 1975, Ser. No. 622,335
Int. Cl.² B60B *3/12*
U.S. Cl. 305—21 **10 Claims**



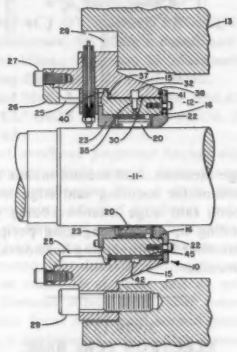
1. A wheel for carrying continuous track chains of crawler type vehicles, comprising:
   a hub member;
   an annular rim;
   first and second spaced panels each connecting the hub to the rim;
   a plurality of first plates each having first and second ends and opposed outwardly extending flanges on the first end, said flanges each being connected to respective first and second panels and each second end being connected to the hub with said first plates being positioned at spaced locations; and
   a plurality of second plates each having first and second ends and opposed outwardly extending flanges on the first end, said flanges each being connected to respective first and second panels, each second end being connected to the rim with said second plates being positioned at spaced locations, said flanges of said second plates being a greater distance from said hub than said flanges of said first plates, and said second plates being arcuately spaced from radial planes of the first plates.

3,979,155

FLEXIBLE DAMPED BEARING SUPPORT

Vijay K. Sood, Murrysville, Pa., and Keith L. Streifert, Duanesburg, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 3, 1975, Ser. No. 619,325
Int. Cl.² F16C *35/08*
U.S. Cl. 308—15 **8 Claims**



1. In a flexible damped bearing assembly, for rotatably supporting a generally horizontally aligned rotor shaft, of the type wherein the bearing is mounted within a movable member suspended from a stationary member upon a series of resilient springs and having a fluid film acting between the movable member and the stationary member for damping the bearing reaction to the shaft, the improvement comprising
   a helper spring positioned beneath the horizontal centerline of the shaft being arranged to act between the stationary member and the movable member to support the weight of the rotor acting upon the bearing, the spring being a beam having a raised support pad at each end arranged to seat against one of said members and a raised reaction pad at the approximate center of the beam arranged to seat in contact against the other of said members.

3,979,156

DECORATIVE AUXILIARY TRANSPARENT TABLE TOP UNIT FOR TABLES, DESKS, AND THE LIKE

Henry Gross, 1715 Ave. X, Brooklyn, N.Y. 11235

Filed May 6, 1975, Ser. No. 575,012
Int. Cl.² A47F *9/00*; A47B *87/00*
U.S. Cl. 312—196 **7 Claims**

1. A decorative auxiliary table top unit for a table, desk and the like, said unit comprising a transparent planar table top member, vertical means disposed below an undersurface of said table top member for supporting said table top member above a top surface of the table, desk and the like to define a compartment space between said undersurface of said top member and the top surface of the table, desk and the like for receiving articles of food, writing material and the like which can be seen through an upper surface of said transparent table top member, said vertical means including a plurality of support members disposed under said table top member, said support members being spaced apart to permit horizontal access to said compartment space, first means securing said

support members to the table, desk and the like, second means for maintaining said table top member stationary relative to said support members, said second means including an edge member disposed around periphery of said table top member, said edge member being disposed against said undersurface of said table top member, said support members being disposed

against said edge member, said second means further including fastening means for securing said edge member to said support members, said edge member being provided with vertically extending lip means engaging peripheral edge of said table top member for preventing horizontal movement of said table top member.

3,979,157

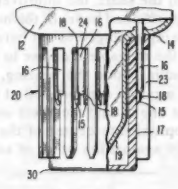
ELECTRON TUBE BASE

Louis Joseph DiMattio, Dunmore, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 10, 1974, Ser. No. 513,599

Int. Cl.² H01R *13/50*

U.S. Cl. 339—145 T **2 Claims**



1. A base for an electron tube comprising:

a hollow cylindrical body of insulating material;

a plurality of longitudinally extending grooves in the outer surface of the body, said grooves extending from one end of said body to a closed end point spaced from the other end of said body, said grooves having two longitudinal walls and an inner groove surface between said walls;

a plurality of apertures extending through said body from the other end thereof to said grooves with each of said apertures opening into a separate one of said grooves; and

a pair of spaced raised guide tracks in each of said grooves, each of said guide tracks extending longitudinally from said closed end point of the groove along one of said walls for a length less than the length of said groove and terminating in an exposed end point within the groove, the exposed end points of said guide tracks being inclined from the inner groove surface to the surface of the raised tracks.

3,979,158

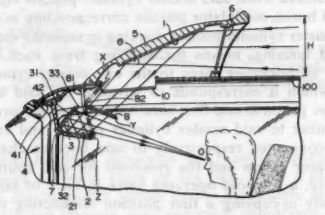
PERISCOPE-TYPE REAR VIEW MIRROR APPARATUS FOR AUTOMOBILE

Makoto Yamashita, Kanagawa; Masagoro Kushida, Isehara; Fumio Niitsuma, Hatano; Masao Enomoto, Yokohama, and Akira Miyamoto, Tokyo, all of Japan, assignors to Ichikoh Industries Limited, Tokyo, Japan

Continuation of Ser. No. 426,691, Dec. 20, 1973, abandoned. This application June 23, 1975, Ser. No. 589,771

Int. Cl.² G02B *5/08*

U.S. Cl. 350—302 **2 Claims**



1. A periscope-type rear view mirror apparatus for an automobile having a roof with an aperture therein in front of the driver's position comprising:

1. a hollow housing fixed to the roof of said automobile above said aperture having an inclined wall inclining at an angle substantially equal to the angle of inclination of the front windshield, having two side walls extending from the opposite side edges of said inclined wall toward the roof of the automobile, and further having a rearward opening opposing said inclined wall and defined by said inclined wall, said side walls, and the roof of said automobile;

2. a planar objective mirror fixed to said inclined wall above the aperture and positioned within the housing opposite the rearward opening;

3. adjustable stay means secured at one end thereof to the inner surface of the automobile body at a position above and near the windshield and extending downward therefrom, said stay means comprised of:

a. a stay bar having a cylindrically shaped fulcrum member at one end thereof transverse to the length of said bar;

b. a mounting bracket attached to the inner surface of the automobile body above and near the windshield having a groove therein for receiving the fulcrum member of said stay bar;

c. a cover plate having a groove therein corresponding to the groove in said mounting bracket, whereby the fulcrum member of said stay bar can fit into the bore formed by the grooves between said mounting bracket and said cover plate; and

d. screws for holding said cover plate over said mounting bracket with said fulcrum member therebetween, whereby adjusting the tightness of the screws will adjust the positioning of said stay bar;

4. a planar reflecting mirror substantially horizontally fixed on the free end of said stay means, below said aperture, so that the reflecting surface of the reflecting mirror faces upwardly toward the aperture in the roof of the automobile and said objective mirror;

5. a planar eye-piece mirror pivotally secured to said stay means adjacent to said reflecting mirror and having its reflecting surface opposed to the reflecting surface of said reflecting mirror at an acute angle thereto and directed toward the eyes of the driver of the automobile, said eye-piece mirror further having a cylindrical extension along one side thereof;

6. said stay bar has therein a socket with flexible sidewalls at a position close to said reflecting mirror for receiving said cylindrical extension of said eyepiece mirror;
7. a bolt passing through said extension of said eye-piece mirror and said sidewalls, whereby tightening the bolt will urge the sidewalls toward each other to hold the cylindrical extension therebetween;
8. transparent panel means on the rearward opening of said hollow housing for sealing this opening from the outside;
9. filter means slightly larger than said reflecting mirror for filtering the intensity of light reflected by said mirrors; and
10. support means located above the windshield and close to said aperture for adjustably supporting said filter means, whereby:

said filter means can be adjustably positioned substantially parallel to the pathway between said objective mirror and said reflective mirror outside of the path of said light rays reflected from said objective mirror to said reflecting mirror, and further

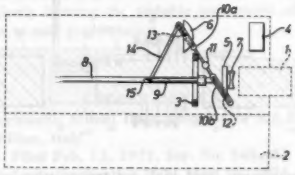
said filter means can be adjustably positioned substantially parallel to the light rays reflected from said eye-piece mirror to the eye position of the driver between said objective mirror and said reflecting mirror, thereby filtering only those light rays traversing the path between said objective and reflecting mirror, and still further

said filter means being slightly larger than said reflective mirror can be adjustably positioned against the edge of said reflecting mirror across the path of light rays travelling from said eye-piece mirror to the eye position of the driver and across the path traversed by the light rays reflected from said objective mirror to said reflecting mirror, thereby filtering the light rays once between said objective mirror and said reflecting mirror, and once between said eye-piece mirror and the eye position of the driver.

3,979,159
PROJECTOR

Jan Erik Asterö, Tumba, Sweden, assignor to Lindaco Ltd., Geneva, Switzerland

Filed Dec. 4, 1974, Ser. No. 529,528
Int. Cl.² G03B *19/18*
U.S. Cl. 352—136 **8 Claims**



1. A projector for alternate projection of dia pictures and cinematographic film comprising: a lens system; a light source emitting light along a given path in a direction through said lens system; means mounting said light source for reciprocal linear movement along said path of its emitted light toward and away from said lens system; a link mechanism mounted upon a stationary point on said projector, said link mechanism being movable between a first and a second position; a condenser lens; a stationary frame for dia pictures; a film feeding mechanism including a film window; said condenser lens and said film feeding mechanism being mounted to said link mechanism for movement into and out of the path of said light emitted from said light source by movement of said link mechanism between said first and second positions; and means connecting said light source with said link mechanism to effect said reciprocal movement of said light source by movement of said link mechanism between said first and second positions; said link mechanism being arranged when moved to said first position to move said film feeding mechanism into operative position into the path of said emitted light in front of and close to said lens system, to move said light source toward said lens system in front of and close to said film window of said film feeding mechanism, and to move said condenser lens out of the path of said emitted light; with movement of said link mechanism to said second position operating to move said film feeding mechanism out of the path of said emitted light, to move said condenser lens to within the path of said emitted light in front of said stationary frame for the dia pictures, and to displace said light source rearwardly away from said lens system to a position behind said condenser lens.

3,979,160
COMPACT OVERHEAD PROJECTOR

Raymond H. Anderson, St. Mary's Point, and Ning Wu, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

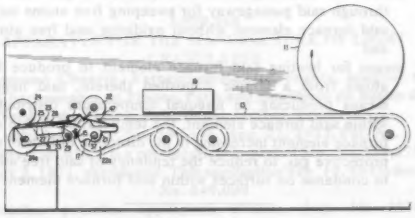
Filed Mar. 3, 1975, Ser. No. 554,418
Int. Cl.² G03B *21/08*; F21V *13/04*, *7/00*
U.S. Cl. 353—63 **5 Claims**

1. A compact overhead projector having aligned along an optical axis, in order, a light source, an aperture plate, a plane mirror, a Fresnel condensing lens, a stage, and a projection head, the latter being adapted to direct and focus onto a remote screen an image of graphic information contained on a transparency laid on the stage, and wherein said light source includes a truncated light-diffusing ellipsoidal reflector having an inner and an outer focal point and an axially disposed incandescent filament offset from said inner focal point toward said outer focal point, said source generating a light pattern having a minimum-diameter high-intensity area, said aperture plate being disposed perpendicularly to said optical axis at a point offset from said outer focal point toward said inner focal point and at the point along said optical axis of said minimum-diameter high-intensity light area, the aperture being of lesser diameter than said high-intensity minimum-diameter area.

3,979,161
COPYING MACHINE FIRE SNUFFER

David G. Kremer, Telford, Pa., and Mosi Chu, Long Island City, N.Y., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 18, 1975, Ser. No. 559,571
Int. Cl.² G03G *15/00*
U.S. Cl. 355—133 **2 Claims**



1. A printing machine for printing images on individual copy sheets comprising:

a copy-sheet transporting system for transporting copy sheets along a predetermined path through a plurality of stations;

a transfer means at a transfer station for transferring heat sensitive developing material to said copy sheets in concentrations representative of said images;

a fusing means at a fusing station for heating said developing material on said copy sheets when said copy sheets are transported through said fusing station;

a fire-extinguishing snuffer for extinguishing fires on said copy sheets caused by the heat of said fusing means said fire-extinguishing snuffer being located downstream of said fusing means at an extinguishing station, said fire snuffer including a pair of flat metallic plates for defining a flat-shaped 0.1 to 0.125 inch gap therebetween and being arranged so that said copy sheets pass through said gap, said plates having a width at said gap which is greater than the widths of said copy sheets; and,

a guidance means including upper and lower wire-like guidance springs upstream of said fire-extinguishing snuffer for directing the leading edges of said copy sheets into said gap.

3,979,162

APPARATUS AND METHOD FOR ATOMIC SPECTROSCOPY

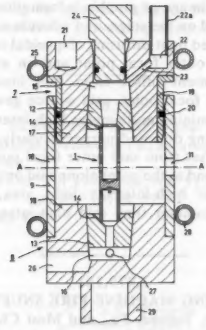
Richard Alexander George, Cambridge, England, assignor to Pye of Cambridge Ltd., Cambridge, England

Filed July 9, 1973, Ser. No. 377,796

Claims priority, application United Kingdom, July 10, 1972, 32253/72

Int. Cl.² G01J *3/30, 3/02*

U.S. Cl. 356—85 **4 Claims**



1. A furnace for heating a sample of a substance to produce free atoms for atomic spectroscopy, comprising;

a hollow furnace element forming a passageway for gas along which a desired sample may be deposited;

means for directing a flow of protective gas into and through said passageway for sweeping free atoms out of said furnace element without oxidising said free atoms; and

means for heating said furnace element to produce free atoms from a sample deposited therein, said heating means producing an unequal temperature distribution within said furnace element, the temperature within said furnace element increasing in the direction of flow of said protective gas, to reduce the tendency of said free atoms to condense on surfaces within said furnace element.

3,979,163

CLEANING AND SCRUBBING TOOL

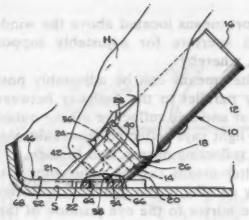
Walter C. Beard, Middlebury, Conn., assignor to Aerosol Techniques Incorporated, Milford, Conn.

Filed June 16, 1975, Ser. No. 586,902

Int. Cl.² A47L *13/26*

U.S. Cl. 401—139 **9 Claims**

1. An in-use regenerable, hand held surface cleaning and scrubbing tool having a cleaning-scrubbing head and a cleaning liquid containing aerosol can having a finger actuable nozzle for directional delivery of cleaning liquid therefrom onto a surface to be scrubbed and forming a handle for scrubbing manipulation of the head, said cleaning head comprising a generally cylindrical synthetic, organic thermoplastic bracket rigidly supported on the can in nozzle surrounding relation and defining a finger access hole adjacent said nozzle, a locally apertured fluid permeable, resilient scrub pad having interior reticulations carried by said bracket in peripherally unsupported relation for conforming engagement with curved surfaces to be scrubbed and with its aperture disposed in



registration with said nozzle opening for free fluid passage through said pad aperture onto a surface to be scrubbed, said pad being coupled to said bracket at an angle of about 45° to the can longitudinal axis by locally deflected bracket extensions within the pad interior having engagement with the reticulation-defining portions of said pad to support said pad during the scrubbing operation-regeneration of absorbed cleaning liquid in the pad and responsive to repeated surface delivery of said cleaning liquid onto said surface through said registered opening and aperture.

3,979,164

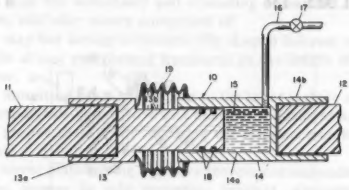
EXPANSION JOINT LOCK FOR LOW TEMPERATURE STRUCTURES

Moyses Kuchnir, Elmhurst, Ill., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jan. 30, 1975, Ser. No. 543,331

Int. Cl.² F16C *9/00;* **F16D** *1/00;* **F16B** *7/00*

U.S. Cl. 403—28 **6 Claims**



1. An expansion joint lock for transmitting compression forces between two structural members which contract as they are cooled down to the temperatures at which they carry loads, comprising:

a. a piston member having an extending piston portion;

b. means for mounting said piston member to a first of the structural members with said piston portion thereof extending in the direction of the compression forces to be transmitted;

c. a reception member having walls defining a chamber therein adapted to receive and slidingly engage said piston portion of said piston member;

d. means for mounting said reception member on the second of the structural members in position to have said chamber therein receive and engage said piston portion; and

e. means for maintaining the space in said chamber between the walls of said chamber and said piston portion filled

with a liquid having a freezing point above the ambient temperature at which said structural members normally carry loads, whereby said liquid is frozen in said chamber at the ambient temperature at which said structural members carry loads to allow transmission of forces between said structural members through said frozen liquid.

3,979,165

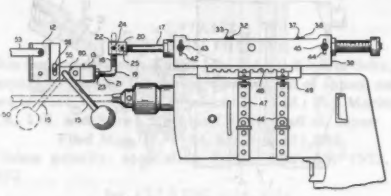
DRILL GUIDE

Arnold S. Pyle, 629 Marston, Glen Ellyn, Ill. 60137

Filed May 22, 1975, Ser. No. 579,952

Int. Cl.² B23B *45/14, 49/00*

U.S. Cl. 408—14 **29 Claims**



1. A universal drill guide for portable, hand-held drills comprising:
housing means,
said housing means being removably and adjustably attachable to a portable hand-held drill;
externally threaded hollow guide means,
said guide means being aligned and supported by said housing means;
platform means,
axially and transversely adjustable shaft means with respect to said platform means and slidably cooperating with said guide means;
spring bias means,
said spring bias means being surrounded and enclosed by said guide means, and contacting said shaft means,
said spring bias means urging said shaft means to slidably extend from said guide means;
stop means,
said stop means being threaded on said external threads of said guide means,
said stop means adapted to contact said shaft means, thus selectively limiting the slidable movement of said shaft means in said guide means.

3,979,166

GETTER DEVICE

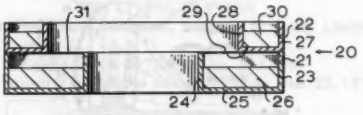
Mario Zucchinelli, Milan, Italy, assignor to S.A.E.S. Getters S.p.A., Milan, Italy

Filed Feb. 12, 1975, Ser. No. 549,487

Claims priority, application Italy, Mar. 18, 1974, 86247/74

Int. Cl.² F04B *37/02*

U.S. Cl. 417—48 **8 Claims**



1. A getter device for releasing an evaporable getter metal in a vacuum tube, said device comprising:
A. a first U-shaped cross-section annular ring, having a bottom wall attached to inner and outer side walls,
B. a compressed particulate getter metal releasing material attached to said ring,
C. a second U-shaped cross-section annular ring, having a bottom wall attached to inner and outer side walls,
D. a compressed particulate getter metal releasing material attached to said second ring,
whereby the axes of the first and second rings are substantially co-extensive and the rings are in heat conducting contact one with the other
in which the external radii of both annular rings are substantially equal and the inside diameter of the second annular ring is greater than the inside diameter of the first annular ring.

3,979,167

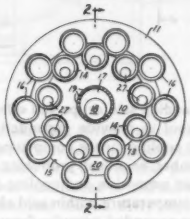
INTERNAL GEAR SET HAVING ROLLER TEETH

Leslie H. Grove, 707 E. Hoyt Ave., St. Paul, Minn. 55106

Filed Jan. 27, 1975, Ser. No. 544,644

Int. Cl.² F01C *1/02, 1/10;* **F03C** *3/00;* **F16H** *1/28*

U.S. Cl. 418—61 B **16 Claims**



1. An internal gear set comprising first and second gear members, the first gear member having n identical cylindrical rollers in slightly oversize semi-cylindrical pockets formed in its radially outer face and equally spaced along a circle, the center of which is the axis of the first gear member, and the second gear member having $n + 1$ identical cylindrical rollers in slightly oversize semi-cylindrical pockets formed in its radially inner face and equally spaced along a circle having the axis of the second gear member as its center, n being an integer greater than 2, the first gear member nesting within and axially offset from the second gear member to provide expanding and collapsing chambers between the gear members upon rotation of one gear member relative to the other, each roller being free to move radially except to the extent that such movement may be restricted by its pocket and by rollers of the other gear member, and the diameter of each roller exceeding the spacing between adjacent rollers of the other gear member.

3,979,168

APPARATUS FOR THE MANUFACTURE OF LIGHT GRANULATES

Raymond Chauvin, Verneuil-en-Halatte, France, assignor to Charbonnages de France, Paris and Houilleres du Bassin du Nord et du Pasde-Calais, Douai, both of, France

Division of Ser. No. 390,345, Aug. 22, 1973, Pat. No. 3,891,734, which is a continuation-in-part of Ser. No. 159,275, July 2, 1971, abandoned. This application Feb. 11, 1975, Ser. No. 549,099

Claims priority, application France, July 10, 1970, 70.25915

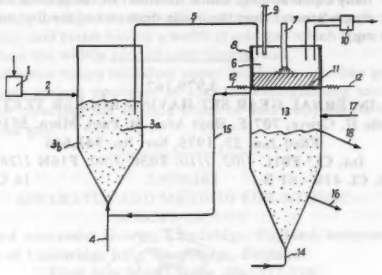
Int. Cl.² B29C *23/00*

U.S. Cl. 425—6 **8 Claims**

1. An apparatus for the manufacture of lightweight aggregate from fusible silico-aluminous material, comprising:
means to reduce said silico-aluminous material to a melt without permitting escape of gases generated within said melt, said means comprising a melting chamber having walls of material not wettable by the fused silico-aluminous material, means to heat said chamber to a tempera-

ture on the order of about 1300° – 1400°C., means to control within said chamber the partial pressure of at least one selected gas in the atmosphere above said melt;

means for producing drops of said molten silico-aluminous material from said melting chamber, said drop producing means forming the bottom of said melting chamber; and



means for expanding said drops and effecting simultaneous cooling thereof to provide expanded granules, said expanding and cooling means comprising an expansion and cooling chamber, said drop producing means forming the ceiling of said expansion and cooling chamber, means to control the temperature within said chamber, and means for removing expanded granules from said chamber.

3,979,169

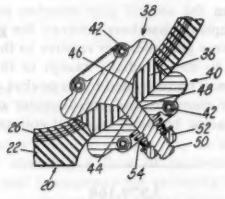
APPARATUS FOR REPAIRING TIRE CASINGS

Benjamin Whittle, R.R. No. 3, Paw Paw, Mich. 49079

Filed Oct. 30, 1970, Ser. No. 85,578

Int. Cl.² B29H *5/16*

U.S. Cl. 425—12 **6 Claims**



1. Apparatus for use in preparation of tires for repairing breaks in the tire casings comprising

inner and outer mold plates adapted to be clamped in opposed non-penetrating relation against inner and outer surfaces of a casing and in overlapping relation to the edges of a break in the casing,

a pin extending from one of said plates to project through the break in the casing and the other of said plates when the plates are lapped against the inside and outside of the casing,

the other of the plates having a hole formed therethrough to slidably pass the shank of the pin,

means coacting with the end of said pin and the opposite side of the other of said plates for clamping said plates to the opposite sides of a casing,

and means forming an outwardly tapering annular protuberance at the outer side of said inner plate located around the axis of said pin and extending axially no more than half the thickness of the casing to be repaired.

3,979,170

APPARATUS FOR INJECTION MOLDING ARTICLES COMPOSED OF A MATERIAL IN WHICH ARE EMBEDDED MASSES OF ONE OR MORE OTHER MATERIALS

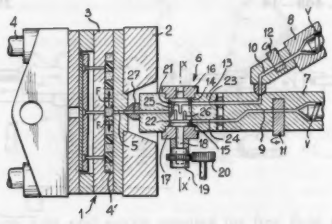
Bernard Leon Monnet, Bellignat, France, assignor to Billion S.A., Oyonnax, France

Filed Sept. 23, 1974, Ser. No. 508,569

Claims priority, application France, Sept. 21, 1973, 73.34012

Int. Cl.² B29F *1/12*

U.S. Cl. 425—130 **10 Claims**



1. Injection molding apparatus for molding articles having local masses of at least one material located here and there in at least one other material, said apparatus comprising a mold, a single passage in communication with the mold, a plurality of separate plastification units each adapted to deliver one of said materials, a distribution system located between the plastification units and the mold and adapted to deliver said materials from the units to said passage, said system comprising a plurality of channels isolated from each other, means for continuously communicating each of said channels with one of said plastification units so that each channel is fed with a continuous stream of material, means for directing the material from the channels to the single passage, and means for breaking up the stream of material in at least one of said channels into measured quantities so that at least one of the materials will be fed to said passage in an intermittent manner to thereby ensure intercalation of said material into at least one other material.

3,979,171

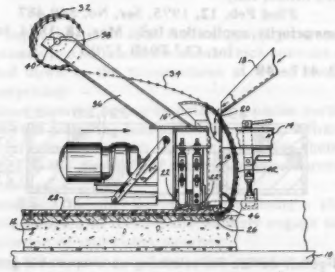
CONCRETE PLANK MACHINE WITH WIRE MESH GUIDE

Robert H. Nagy, 1720 Arrowhead Court, Brookfield, Wis. 53005

Filed Nov. 29, 1974, Ser. No. 528,534

Int. Cl.² B28B *13/02, 23/06*

U.S. Cl. 425—64 **5 Claims**



1. In a movable machine for manufacturing concrete planks by the discharge of concrete onto a bed, said machine having a frame, having means including at least one hopper mounted on the frame to extend transversely thereof for discharging concrete which is to form the plank structure onto said bed,

and having a chute supported on the frame in a position to extend transversely of the frame over said hopper and direct concrete into said hopper, the improvement comprising means on said frame in trailing relationship with said hopper for supporting a supply of reinforcing wire mesh, means on said frame for guiding said wire mesh from said supply between said chute and said hopper in a position where the concrete from the chute passes through said wire mesh into the hopper substantially throughout the length of the hopper, said guiding means being positioned to direct the wire mesh downwardly in a position in advance of the hopper and then in a reverse direction beneath said hopper in a position where it is laid on the plank which is being formed while additional concrete is discharged thereover from the hopper.

3,979,172

ICE CREAM FREEZER

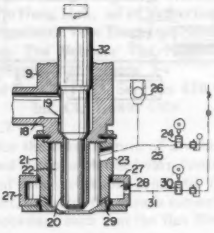
Yukio Sogo, Kawasaki; Kazuo Ido, Fuchu; Kiyoshi Seko, Nagoya, and Hiroshi Takahashi, Numazu, all of Japan, assignors to Snow Brand Milk Products Co., Ltd.; Fuji Machinery Co., Ltd. and Sanwa Machine Co., Inc., all of, Japan

Filed Mar. 18, 1974, Ser. No. 451,861

Claims priority, application Japan, Mar. 29, 1973, 48-36032

Int. Cl.² A23G *9/28, 9/24*

U.S. Cl. 425—104 **3 Claims**



1. An ice cream dispenser comprising: a nozzle for forcing out ice cream, and means for supplying solid material onto the ice cream being forced out through said nozzle, said supplying means comprising a member surrounding said nozzle and spaced therefrom so as to form an annular chamber around said nozzle, at least one port leading into said annular chamber, and means for feeding solid material through said at least one port and through said chamber onto the ice cream being forced out through said nozzle, said feeding means comprising means for blowing said solid material through said port, and a valve for controlling the feeding of said solid material, and supplemental means for blowing said solid material against the ice cream being forced out through said nozzle.

3,979,173

RECEIVER AND TRANSFER DEVICE FOR TRANSFERRING DOUGH FROM A SUPPLY SOURCE TO A RECEIVING STATION

Raymond Fox, Leeds, England, assignor to Oddy Limited, Leeds, England

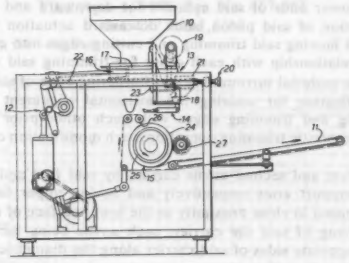
Filed Jan. 22, 1975, Ser. No. 543,055

Claims priority, application United Kingdom, Jan. 22, 1974, 2980/74

Int. Cl.² A21C *5/00*

U.S. Cl. 425—238 **9 Claims**

1. A dough treatment apparatus having a dough divider; an inlet for the supply of dough to said divider; an outlet for the discharge of divided pieces of dough from said dough divider; and a receiver and transfer device arranged to receive the divided pieces of dough from said outlet, and to transfer the pieces to a discharge location; said receiver and transfer device comprising a plurality of catcher members mounted for pivotal movement about an axis between a substantially horizontal receiver position and a discharge position, and being displaceable parallel to said axis between first and second positions, said catcher members being positioned to receive divided pieces of dough from said outlet when said catcher members occupy said substantially horizontal receiver position and said first axial position, and being positioned to discharge divided pieces of dough at the discharge location when the catcher members occupy said discharge position and said



second axial position; first drive means coupled with said catcher members to effect axial displacement of said catcher members between said first and second positions, while the catcher members are maintained in said substantially horizontal receiver position; and second drive means, coupled with said catcher members independently of said first drive means, and arranged to effect pivotal movement of the catcher members from said substantially horizontal receiver position to said discharge position only after substantial completion of displacement of the catcher members by said first drive means from said first position to said second position.

3,979,174

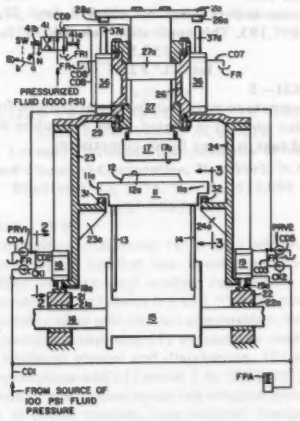
ARTICLE TRIMMING APPARATUS

Thomas F. Hillman, Bath, and Arthur H. Pienkoski, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Oct. 24, 1975, Ser. No. 625,644

Int. Cl.² B29C *3/00, 17/08*

U.S. Cl. 425—292 **5 Claims**



1. In an apparatus for trimming thermoplastic material surrounding the bordering edge of an article formed in a die

from a sheet of thermoplastic material arranged over said die, such die having an upwardly disposed trimming edge, and such apparatus including first and second upwardly extending support arms supporting at their upper ends a relatively large hydraulic cylinder embodying a piston extending through the ends of such cylinder; a trimmer having a lower cutting edge cooperative with said trimming edge of said die for trimming said thermoplastic material, such trimmer being attached to the lower end of said piston; a die carrier supporting said die below said cylinder; and conduit means for alternately supplying hydraulic fluid at a relatively high pressure to the upper and lower ends of said cylinder for downward and upward actuation of said piston, such downward actuation of such piston moving said trimming and cutting edges into cooperative relationship with each other for trimming said thermoplastic material surrounding said bordering edge of said die; a modification for assuring the horizontal alignment of said cutting and trimming edges with each other prior to said thermoplastic trimming operation, such modification comprising;

I. first and second anvils carried by said first and second support arms respectively and having upper faces disposed in close proximity to the lower surface of an overhang of said die carrier, such anvils being located on opposite sides of said carrier along the diametric centerline thereof;

II. similar first and second relatively small hydraulic cylinders and associated piston rods attached to said first and second support arms respectively for upward actuation thereof and thereby said faces of said anvils into contact with said lower surface of said overhang;

III. means including pressurized fluid conduits for supplying hydraulic fluid at an increasingly intensified pressure to said first and second cylinders to actuate said faces of said anvils upward and into contact with said lower surface of said overhang when said piston of said large hydraulic cylinder is actuated downwardly by said hydraulic fluid supplied to said upper end of such large cylinder; and

IV. pressure relief valve means connected to said pressurized fluid conduits for relieving further intensification of the pressure of said intensified hydraulic fluid when such fluid exceeds a preselected intensified pressure above that required for said upward actuation of said faces of said anvils.

3,979,175

VAPOR RECOVERY AND DISPOSAL SYSTEM

Abraham Kattan, North Miami Beach, Fla., and John E. Gwyn, Pasadena, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 401,514, Sept. 27, 1973, Pat. No. 3,897,193. This application Feb. 24, 1975, Ser. No. 552,573

Int. Cl.[2] F23G *7/06*

U.S. Cl. 431—5 **4 Claims**

1. A system to recover and dispose of gasoline from gasoline vapor-laden air that is vented from a gasoline storage tank while said tank is being filled, comprising:

A. means for collecting vapor-laden air from said storage tank,

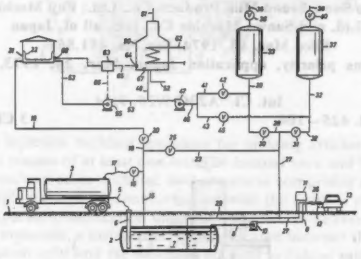
B. at least one vessel containing a bed of solid adsorbent capable of selectively adsorbing gasoline from said vapor-laden air,

C. a vent to the atmosphere from said vessel,

D. a valved inlet into said vessel on the other side of said bed from said vent, said inlet connected to said means for collecting vapor-laden air,

E. a valved conduit from said vessel connecting the inlet side of said bed to the inlet of a furnace,

F. means for measuring the volume of vapor-laden air passing through the valved inlet into the vessel,



G. means for drawing backwash air through said bed for desorbing gasoline therefrom and discharging said gasoline-containing air in said furnace,

H. means of igniting said desorbed gasoline in said furnace,

I. control means operatively connected to said volume measuring means, to means for drawing backwash air and to means for igniting, for activating said means for drawing backwash air and means for igniting, upon passing of a predetermined volume of vapors through said volume measuring means, and

J. means for stopping said discharge of backwash air to the furnace when combustion of the gasoline is concluded.

3,979,176

PROCESS FOR THE CONTINUOUS LEVEL PROCESSING OF POLY-ACRYLONITRILE IN THE HYDRATED CONDITION

Leo Kaiser, Aesch, and Otto Nothiger, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 31, 1975, Ser. No. 545,847

Claims priority, application Switzerland, Feb. 6, 1974, 1626/74

Int. Cl.² D06P *3/70*

U.S. Cl. 8—177 R **9 Claims**

1. A process for the continuous treatment, of hydrated polyacrylonitrile tow, with a dyestuff or an optical brightening agent to give a level treatment effect, comprising the steps of:

a. spreading out the wet tow to form a ribbon having a maximum thickness of 2 mm. and

b. impregnating the spread-out tow ribbon with a processing liquor that contains a dyestuff or an optical brightener.

3,979,177

METHOD FOR THE MANUFACTURE OF VOLUMINOUS BLENDED YARNS AND FABRICS AND KNITTINGS TO BE MANUFACTURED FROM THEM

Hendrak Johannes Selling, Voorburg; Hendrick Van Lingen, The Hague; Njo Hong Han, all of Netherlands, assignors to Nederlande Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid Handle En Verkeer, The Hague, Netherlands

Filed Dec. 3, 1973, Ser. No. 420,935

Int. Cl.² D08M *9/04*

U.S. Cl. 8—115.7 **9 Claims**

1. A method for the manufacture of a voluminous blended yarn characterized in that a blended yarn consisting essentially of flax fibres and non-shrinkable synthetic fibres is given a swelling treatment, whereby the yarn is subjected to a tensionless shrinking procedure such that the flax fibres shrink maximally by 35%.

3,979,178

FINISHING OF CELLULOSE FABRICS WITH N-METHYLOL AMIDE CROSSLINKING AGENTS, MAGNESIUM SULFATE AND SULFURIC ACID

Robert M. Reinhardt, New Orleans, and Russell M. H. Kullman, Metairie, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 9, 1974, Ser. No. 513,361

Int. Cl.² D06M *13/40*

U.S. Cl. 8—185 **4 Claims**

1. In a process of finishing cellulose-containing fabrics to impart durable press properties by treatment with aqueous formulations containing N-methylol amide crosslinking agents, crosslinking catalysts, and, other compatible additives or agents to enhance properties other than durable press or strengh properties, the improvement consisting of:

a. adding to aqueous formulations as the sole crosslinking catalyst, a mixture of sulfuric acid and magnesium sulfate in amounts such that for every 100 parts by weight of said formulation there are about from 5 to 20 parts by weight N-methylol amide crosslinking agent, about from 0.2 to 2 parts by weight of sulfuric acid, and about from 0.3 to 2.5 parts by weight of magnesium sulfate;

b. impregnating a cellulose-containing textile with the formulation from a; and Serial No. 513,361

c. curing the wet, impregnated textile by heat treatment at from about 60°C to about 100°C for about from 2 minutes to about 8 minutes to obtain a moisture content in the treated textile of about 2 to 5%; and

d. washing and drying the textile.

3,979,179

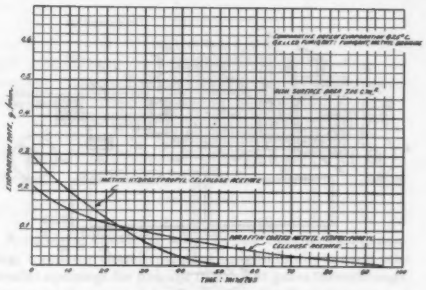
PROCESS AND COMPOSITION FOR REDUCING EVAPORATION OF VOLATILE LIQUIDS

James Teng, St. Louis County, Mo., assignor to Anheuser-Busch, Incorporated, St. Louis, Mo.

Filed Apr. 1, 1974, Ser. No. 457,081

Int. Cl.² B01J *1/18*

U.S. Cl. 21—60.5 A **7 Claims**



1. The method of gelling volatile organic liquids wherein the rate of evaporation of the volatile organic liquid is reduced, comprising the steps of:

A. agitating a cellulose ester having a degree of substitution from about 0.1 to about 2.8 and a degree of molar substitution of hydroxypropyl groups of about 2 to about 8,

B. adding with agitation about 5 to about 35% by weight paraffin heated to a temperature above its melting point,

C. cooling the mixture while continuing the agitation,

D. agitating the mixture until free flowing granules are formed, said granules consisting of cellulose ester particles coated with the paraffin,

E. adding about 0.5 to about 4 grams of the granules to each 100 ml. of volatile organic solvent to be gelled with agitation, and

F. forming a continuous and resilient film over the entire surface of the gel.

3,979,180

STABILIZED CROSSLINKED POLYETHYLENE AND ETHYLENE-VINYL ACETATE

George E. Lorand, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Sept. 12, 1975, Ser. No. 612,891

Int. Cl.² C08J *3/20*

U.S. Cl. 260—23 H **20 Claims**

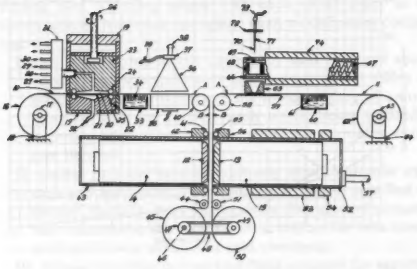
1. A composition comprising (a) a resin selected from the group consisting of unfilled low density polyethylene and mineral filled ethylene-vinyl acetate copolymer, (b) an organic peroxide, and (c) about 0.5 to 1.95 parts per hundered parts of polymer of an anti-oxidant composition, said anti-oxidant composition comprising (1) at least one member of the group of hindered phenol and diarylamine, (2) a metal organic thiophosphate and (3) about 1 to 100 parts per million parts of resin of a transition metal salt selected from the group consisting of cobalt stearate, iron stearate, manganese stearate, nickel stearate, and the trivalent chromium salt of mercaptobenzothiazole.

3,979,181

TAPE TRANSPORT FOR LUMINESCENT REACTION TESTING

Chris J. Plakas, Alexandria, Va., assignor to Vitatect Corporation, Alexandria, Va.

Filed Nov. 12, 1975, Ser. No. 630,943
Int. Cl.[2] G01N *21/30, 33/16*
U.S. Cl. 23—230 B **3 Claims**



1. In a surface reaction system for optically detecting reactive materials in a test sample by means of luminescent reaction comprising:

A. means for placing the residue obtained by filtering a sample of reactive material on an elongated flexible carrier element when the carrier element is in a first position,

B. means for advancing the carrier element to a second position,

C. means for placing a reagent material in contact with the residue at the second position, and

D. means for measuring the luminescence produced by the reagent material in contact with the residue,

the improved means for advancing the carrier element comprising:

E. a pair of pinion rollers, each having a plurality of teeth thereon, the carrier element being gripped between the rollers, and

F. means for driving at least one of the pinion rollers to advance the carrier element between the rollers.

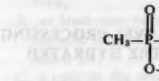
3,979,182

CHEMICAL DETECTION OF NITROGEN CONTAINING COMPOUNDS

Michael D. Zumalt, Sacramento, Calif.; Neil R. Hofmann, Angola, N.Y., and Melvin C. Bassett, Baltimore, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 29, 1969, Ser. No. 821,168
Int. Cl.[2] G01N *27/62*
U.S. Cl. 23—232 R **7 Claims**

1. In a method for detecting toxic compounds the step comprising contacting an effective amount of compounds of the formula



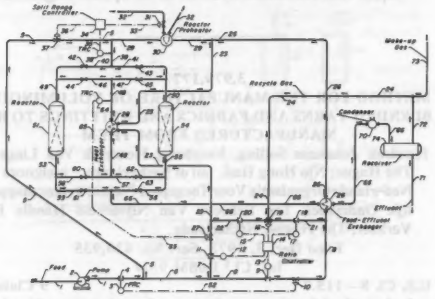
wherein R is ethyl or isopropyl and their decomposition products with a composition comprising a lower alkyl alcohol, a dialkyl ketone, a nitrobenzene and collodion.

3,979,183

HEAT EXCHANGE AND FLOW CONTROL SYSTEM FOR SERIES FLOW REACTORS

Norman H. Scott, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 25, 1974, Ser. No. 527,007
Int. Cl.[2] G05D *11/02*; G06F *15/46*; G06G *7/58*
U.S. Cl. 23—253 A **1 Claim**



1. In an apparatus comprising two reactors, fluid conveying means connecting the two reactors for series flow, means for feeding reactants to the fluid conveying means and reactors, and heat exchange means utilizing reactor effluent to preheat feed streams, the improvement comprising a temperature and flow control system having:

a. a first flow rate measuring and controller means for a primary feed stream, said controller means generating a first signal;

b. a first bifurcating means for splitting said feed stream into a first fluid stream and a second fluid stream, said first bifurcating means being in interconnection with said feed stream;

c. a second bifurcating means for splitting said second fluid stream into a third fluid stream and a fourth fluid stream, said second bifurcating means being in interconnection with said fluid stream;

d. a second flow rate measuring and signal means which generates a signal representative of a flow rate in said fourth fluid stream;

e. a first contol valve means connected to said first flow rate sensing and controlling means for regulating the rate of flow of said fourth fluid stream in accordance with said first signal means, said first control valve means being in interconnection with said fourth fluid stream;

f. a third flow rate measuring and signal means which generates a signal representative of a rate of flow in said third fluid stream;

g. a second control valve means for division of a hydrogen rich system into a first gas stream and a second gas stream, a first commingling means for the admixture of said first gas stream with said third fluid stream to form a first reactant stream, and a second commingling means for the admixture of said second gas stream with said fourth fluid stream to form a second reaction stream, said control valve means being in interconnection with said first and second gas streams;

h. a first ratio control means connected to said second and third signal means for regulation of the rate of flow of said

first and second gas streams in response to said second and third signal means;

i. a first heat exchange means for heating said first reactant stream, said first heat exchange means being in interconnection with a reactor effluent from a first series reactor;

j. a second heat exchange means for heating said second reactant stream, said second heat exchange means being in interconnection with a reactor effluent from a second series reactor;

k. a third commingling means for formation of a first reaction system stream from admixture of said first reactant stream with said second reactant stream, said commingling means in connection with said first reactant stream and second reactant stream;

l. a first preheater means for heating said first reaction system stream;

m. a fourth commingling means for admixture of said first reaction system stream with said first fluid stream to produce a second reaction system stream, said second commingling means being in interconnection with said first reaction system stream and first fluid stream;

n. a first temperature measuring means for determination of the temperature in said second reaction system stream;

o. a fourth signaling means for transmittal of the temperature determined by said first temperature recordation means to a first split range control means, said fourth signaling means being in interconnection with said first temperature recordation means and first split range control means; and,

p. a first split range control means for generation and transmittal of a fifth signal, said means utilized to increase the temperature in said preheater means or of actuating a change of flow rate of said first fluid stream as determined by a comparison of said fourth signaling means with a predetermined temperature value of said second reaction system stream, said first split range control means being in interconnection with said fifth signal and first fluid stream.

3,979,184

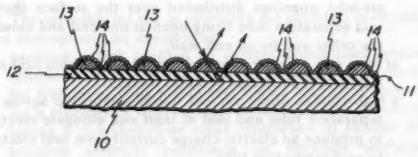
DIAGNOSTIC DEVICE FOR VISUALLY DETECTING PRESENCE OF BIOLOGICAL PARTICLES

Ivar Giaever, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 27, 1975, Ser. No. 580,603

Int. Cl.² G01N *33/16*

U.S. Cl. 23—253 TP **15 Claims**



1. A diagnostic device for detecting the presence or absence of select biological particles in a liquid sample consisting of:

a substrate member, at least one face of which is a non-transparent surface of metal, said metal surface being a comparatively poor reflector of light,

a thin, transparent first layer of dielectric material adhered to said surface,

a transparent second layer of metal adhered to the outer face of said first layer,

a monomolecular layer of biological particles specific to the select biological particles overlying at least a portion of said second layer.

3,979,185

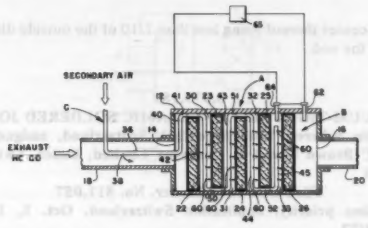
CATALYTIC CONVERTER HAVING PLURAL REACTION STAGES WITH TEMPERATURE-COMPARING MEANS THEREIN

David John Stevenson, Arcadia, Calif., assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Jan. 21, 1974, Ser. No. 434,776

Int. Cl.² B01J *8/04*; F01N *3/15*, *7/00*

U.S. Cl. 23—288 FB **12 Claims**



1. A catalytic converter for purifying exhaust gases, comprising: a reactor chamber having longitudinally spaced inlet and outlet openings for passage of exhaust gases therethrough, oxidizing catalyst means longitudinally distributed along said chamber between said inlet and outlet openings, means for causing exhaust gases to flow in a longitudinal direction successively through said longitudinally distributed oxidizing catalyst means for contact with said oxidizing catalyst means, secondary air feed means for feeding secondary air into said chamber at a plurality of longitudinally spaced-apart locations between said inlet and outlet openings, said secondary air feed means extending longitudinally through said chamber for a substantial portion of the length thereof between said inlet and outlet openings in direct exposure to the exhaust gases passing through said chamber for pre-heating said secondary air flowing therethrough prior to discharge of said secondary air from said secondary air feed means into said chamber, said secondary air feed means having a plurality of outlet means at longitudinally spaced-apart locations between said inlet and outlet openings for distributing a portion of said secondary air flowing through said secondary air feed means at each of said longitudinally spaced-apart locations, said oxidizing catalyst means including a plurality of catalyst beds longitudinally spaced apart in said chamber between said inlet and outlet openings therein to define a plurality of longitudinally spaced reactor stages each comprising one of said beds and the space longitudinally downstream of each said bed, and temperature comparing means for comparing the temperature of at least two of said stages so as to obtain the temperature differential between said stages.

3,979,186

STEEL ROD FOR PRESTRESSING CONCRETE

Katsuhisa Mizuma, Fujisawa, Japan, assignor to Neturen Company Ltd., Tokyo, Japan

Filed Mar. 17, 1975, Ser. No. 559,302

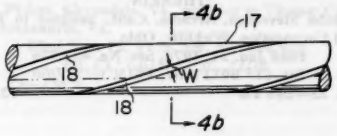
Claims priority, application Japan, Oct. 25, 1974, 49-122427; Oct. 25, 1974, 49-122428

Int. Cl.² B21C *37/04*

U.S. Cl. 29—183.5 **7 Claims**

1. A steel rod for prestressing concrete by pretensioning the rod and then casting the concrete therearound said rod, having a circular cross-section and having a plurality of spiral grooves therearound and at a uniform pitch of about 10 times the diameter of said rod, the total width of the voids of the spiral grooves being 1/6 – 2/5 of the total circumference of the

rod, the width of each spiral groove being from 1/24 – 2/15 of the total circumference, and the depth of each spiral groove



at the center thereof being less than 1/10 of the outside diameter of the rod.

3,979,187

VACUUM-TIGHT METAL-CERAMIC SOLDERED JOINT

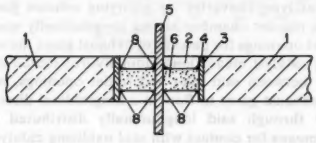
Fridolin Scherer, Untersiggenthal, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Oct. 1, 1974, Ser. No. 511,057

Claims priority, application Switzerland, Oct. 1, 1973, 14043/73

Int. Cl.² B32B *15/00*

U.S. Cl. 29—195 **10 Claims**



1. A vacuum-tight metal-ceramic soldered joint comprising:
a ceramic member having an aperture defined therein,
a metallic layer on the wall of said aperture,
a solderable plug,
an aperture defined within said solderable plug; and
an electrical and mechanical through-connection disposed within said aperture of said solderable plug;
said solderable plug comprising fused metal powder and solder and positioned in said aperture of said ceramic member bonding together said metallic layer and said through-connection.

3,979,188

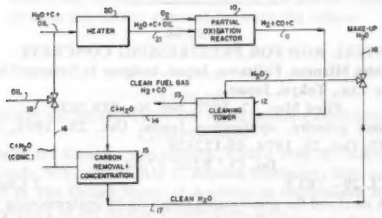
PARTIAL OXIDATION CARBON REMOVAL PROCESS

Robert A. McCallister, Mountain Lakes, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Oct. 25, 1974, Ser. No. 518,007

Int. Cl.² C01B *2/14*

U.S. Cl. 48—215 **5 Claims**



1. A method for the recovery of unreacted carbon produced by reaction of fossil fuel and oxygen in a partial oxidation reactor to produce an effluent stream of synthesis gas and entrained carbon comprising of the steps of: washing the effluent stream with water to remove unreacted carbon therefrom to produce a stream of clean synthesis gas and a stream of water and entrained carbon, concentrating the stream of carbon and water formed during the cleaning step into a slurry of carbon and water containing about 5 to 7 percent by weight of carbon and producing a stream of relatively clean water substantially free of carbon, introducing said slurry into a vessel, combining the slurry in said vessel with a fuel oil, mixing said fuel oil and slurry in said vessel to produce a feed stream, then pumping the feed stream through a preheater and injecting the feed stream, without vaporization, into the partial oxidation reactor.

3,979,189

ELECTROSTATIC FILTER

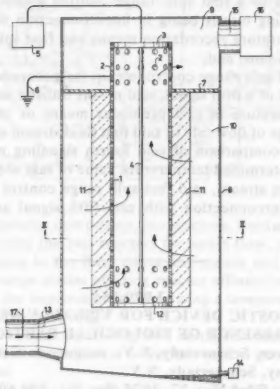
Magnus Alskog, Skara, Sweden, assignor to Aktiebolaget Lectrostatic, Skara, Sweden

Filed Jan. 29, 1975, Ser. No. 545,077

Claims priority, application Sweden, Feb. 13, 1974, 7401939

Int. Cl.² B03C *3/45*

U.S. Cl. 55—131 **8 Claims**



1. An electrostatic filter for separating solid particles or liquid particles or a combination of both suspended in air, comprising:
an electrically conducting, elongate separation tube having air-inlet openings distributed over the surface thereof, said separation tube being open at one end and closed at the other end by an end wall,
at least one elongate electrode positioned within said separation tube in spaced relation thereto,
a high-voltage direct current source connected across said separation tube and said at least one elongate electrode to produce an electric charge current from said electrode to said separation tube,
a layer of air-permeable material on the outer surface of said separation tube covering all of said air-inlet openings,
a housing having an air-intake opening at one end thereof and an air-outlet opening at the other end thereof, said separation tube being supported within said housing by sealing means transversely dividing the interior of said housing into a suction chamber and a separation chamber with the open end of said separation tube communicating with the suction chamber having the air-outlet opening and the remainder of said separation tube projecting into the separation chamber having the air-intake opening, and

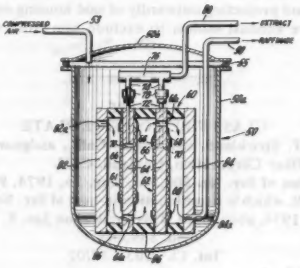
suction means connected to the air-outlet opening of said housing for drawing air into said separation tube through said layer of air-permeable material and said air-inlet openings, said layer of air-permeable material being dimensioned and said air-inlet openings being dimensioned and spaced over the surface of said separation tube to provide an air resistance such that substantially the same pressure drop of the air passing through said layer and said air-inlet openings to the interior of said separation tube along the whole of the length of said separation tube covered by said layer is created.

3,979,190

SERIES FEED MEMBRANE STACK

Jonathan W. Hedman, Burnt Hills, N.Y., assignor to General Electric Company, Milwaukee, Wis.

Filed June 4, 1974, Ser. No. 476,419
Int. Cl.² B01D *59/14*
U.S. Cl. 55—158 **9 Claims**



9. The assembly for use in providing gas enriched in oxygen from atmospheric air comprising:

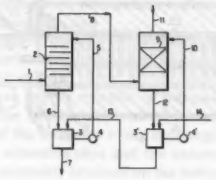
a pressure vessel adapted to receive compressed atmospheric air from a source; an array of selectively permeable membrane cells within said vessel, said array including a plurality of rigid support substrates, each substrate having a polyphenylene ether membrane of smaller dimension sealingly positioned on opposite surfaces thereof, said membranes being adapted to permit oxygen to permeate therethrough at a greater rate than nitrogen, each substrate having passage means for the removal of oxygen enriched gas from the interface of the membranes and substrates; means for mounting said substrates in parallel, spaced apart relation including a plurality of gasket members positioned in sealing relationship with the peripheral portions of each of said substrates and end plates positioned in sealing relationship with the outermost gasket members, said end plates and said substrates each defining a flow port therethrough at alternate ends thereof to form a series flow path through said array; and means for extracting oxygen depleted air from the downstream end of said series flow path.

3,979,191

METHOD FOR DENITRATING EXHAUST GASES

Isao Furuta, Mikata; Kazuhito Yagaki, and Masami Takao, both of Kobe, all of Japan, assignors to Kobe Steel Ltd., Kobe, Japan

Filed Jan. 27, 1975, Ser. No. 544,380
Int. Cl.² B01D *53/34*
U.S. Cl. 55—68 **6 Claims**



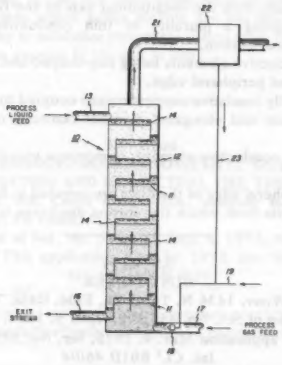
1. A method for removing NO from an exhaust gas which comprises washing the exhaust gas with a first aqueous solution containing 5–42% wt. of a chloride of Mg or Ca, and 0.01–20% wt. of a hypochlorite of Mg or Ca, and washing said washed gas with a second aqueous solution of an alkali.

3,979,192

CONTROL OF FOAM GENERATION IN GAS-LIQID SEPARATION TOWERS

Stanley Y. Hobbs, Scotia, and Charles F. Pratt, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 20, 1974, Ser. No. 525,289
Int. Cl.² B01D *47/12*
U.S. Cl. 55—87 **6 Claims**



1. In the process of contacting a liquid with a pressurized gas wherein the liquid is introduced into the upper region of a separation tray tower having a plurality of sieve trays and a plurality of interconnecting downcomers, the pressurized gas being admitted in the lower region of said tower in countercurrent flow with the liquid, the improvement comprising the steps of intermittently dispersing a finely-divided antifoam composition into the pressurized gas at a location below the sieve trays such that the antifoam continues unabated through the plurality of trays in the tower to effectively inhibit foam formation therein.

3,979,193

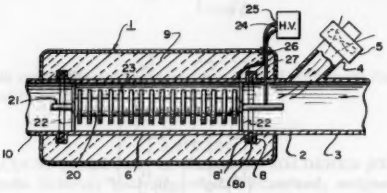
CORONA DISCHARGE APPARATUS

Jack Sikich, 105 S. Orchard, Waukegan, Ill. 60085

Continuation of Ser. No. 268,834, July 3, 1972, abandoned, which is a continuation of Ser. No. 105,013, Jan. 8, 1971, abandoned. This application Nov. 29, 1974, Ser. No. 528,407

Int. Cl.[2] B03C *3/04*

U.S. Cl. 55—123 **7 Claims**



1. A pollution control apparatus for reducing the amount of pollutants in a fluid discharge comprising:

a pollution elimination means having an inlet adapted to be attached downstream of a source emitting a fluid discharge, an outlet to release treated fluid discharge, and flow passage therebetween,

said pollution elimination means including spaced conductive members positioned downstream of the inlet to allow the fluid discharge to pass adjacent thereto,

a source of alternating electrical potential coupled to the spaced conductive members to create a corona discharge therebetween for effecting chemical reactions to reduce the amount of pollutants in the fluid discharge passing through and the pollutants eliminating means and prevent adherence of material in the fluid discharge to the pollution elimination means,

said spaced conductive members comprise a first hollow conduit and a second elongated member positioned in spaced relation therein,

said second elongated member includes a rod extending co-axially with the longitudinal axis of the flow passage and having a plurality of thin conductive elements mounted thereon,

said conductive elements being cup-shaped and including a serrated peripheral edge,

electrically insulative support means coupled to said rod to maintain said elongated member centrally of said conduit,

said thin conductive elements comprise a plurality of discs, and

the peripheral edge of the discs are serrated to form a series of points from which the corona discharge is emitted.

3,979,194

DUST FILTER

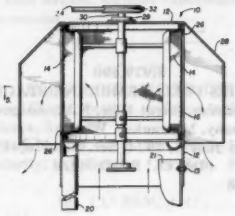
Abram J. Wiser, 1436 N. Tenth St., Enid, Okla. 73701

Continuation of Ser. No. 458,299, April 5, 1974, abandoned. This application Mar. 4, 1975, Ser. No. 555,103

Int. Cl.[2] B01D *46/04*

U.S. Cl. 55—296 **1 Claim**

1. A dust filter to be mounted on the upper end of an air exhaust pipe comprising, in combination, a circular wall defining an impervious tubular housing having an open bottom inlet for the axial reception of exhaust air and means for attaching it to the upper end of an exhaust pipe; said housing having a closed top and diametrically opposed lateral exhaust outlets formed in the side thereof adjacent to the top; said outlets being of substantial width and extending downwardly more than half of the height of said housing; a tubular filter unit mounted in said housing and covering said lateral exhaust outlets so as to filter dust particles from the air being exhausted therethrough; a power driven shaft rotatably mounted in the top of said housing and depending concentrically therefrom; a pair of brushes vertically coextensive with said filter unit mounted on said shaft for rotation therewith and engaging the inner surface of said filter to brush therefrom dust particles which are deposited by air passing vertically through said open bottom inlet and laterally out of said exhaust outlets; filtered dust particle collecting means concentric and radially coextensive with said filter comprising an annular trough fixed



to the inside bottom portion of said circular wall of said housing and encircling said air inlet; a dust outlet pipe connected to said trough and a dust particle scraper fixed to said shaft and conforming with and movable in said trough to move collected dust particles to said dust outlet pipe; and a hood fixed to and projecting outwardly of said housing over each of said entire exhaust outlets to exclude rain from within said housing.

3,979,195

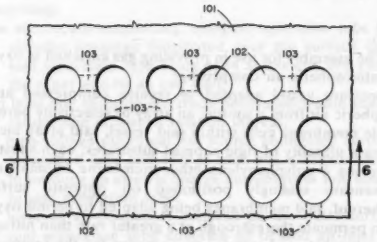
GLASS FIBER ORIFICE PLATE

Edward T. Strickland, San Diego, Calif., assignor to Kaiser Glass Fiber Corporation, Oakland, Calif.

Division of Ser. No. 500,303, Aug. 26, 1974, Pat. No. 3,905,790, which is a continuation-in-part of Ser. No. 432,997, Jan. 14, 1974, abandoned. This application Jan. 8, 1975, Ser. No. 539,403

Int. Cl.[2] C03B *37/02*

U.S. Cl. 65—1 **6 Claims**



1. An orifice plate for forming glass fiber filaments including a generally flat orifice area having a plurality of orifices therein, each said orifice being adapted for the formation of a fiber-forming cone of molten glass, and capillary grooves in the underside of said orifice plate connecting adjacent orifices, whereby controlled flooding occurs between adjacent orifices connected by a capillary when a fiber drawn from one of said orifices breaks.

3,979,196

METHOD FOR THE HOT-WORKING OF GLASS

Berthold Frank; Bernhard Lersmacher, both of Aachen, and Hans-Jürgen Lydtin, Stolberg, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 17, 1975, Ser. No. 632,273

Claims priority, application Germany, Dec. 12, 1974, 2458787

Int. Cl.² c03B *11/00*

U.S. Cl. 65—25 R 6 Claims

1. A method for the hot-working of glass by means of a mould which consists of glassy carbon at least at its surface contacting the heated glass, characterized in that the glassy carbon of the mould used has a porous structure, in which pore size and pore density (pore distribution) are adjusted so that during the moulding process the glass cannot penetrate into the surface, and the pores are accessible from the side of the mould remote from the heated glass, that prior to the moulding the pores are filled with a gas-forming liquid or a gas, and the resulting gas film between the glass and the surface of the mould is removed after completed moulding.

3,979,197

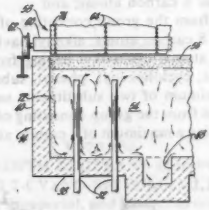
METHOD OF OPERATING GLASS MELTING FURNACE

Magnus L. Froberg, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 458,142, April 5, 1974, abandoned. This application May 1, 1975, Ser. No. 573,700

Int. Cl.² C03B *5/16*

U.S. Cl. 65—135 14 Claims



1. In a method of operating an electrically heated, melting furnace having a tank formed in part by a wall of refractory, said method including forming a pool of molten material in the tank, adding a layer of batch material to the surface of the pool, and heating the pool internally, the improvement comprising adding an infrared ray absorbing compound to the surface region of the molten material only adjacent the wall to form adjacent the wall a generally vertically curtain-like region of downwardly moving material, such curtain-like region of downwardly moving material having a composition containing at least one-quarter of one percent of such compound and in an amount sufficient to resist the erosive effects on the refractory wall from infrared radiation emitted from within the pool but insufficient to significantly affect the physical characteristics of the molten pool, said compound comprising an oxide selected from the group consisting of copper, uranium, cobalt, nickel, iron and vanadium.

3,979,198

POLYURETHANE PLANT GROWTH MEDIUM

Charles E. Bardsley, Pascagoula, Miss., assignor to Agritec, Co., Houston, Tex.

Continuation of Ser. No. 410,881, Oct. 29, 1973, abandoned. This application Sept. 27, 1974, Ser. No. 509,980

Int. Cl.² A01N *7/00*

U.S. Cl. 71—1 4 Claims

1. A plant growth medium consisting essentially of

a polyurethane matrix having at least 40% open cells and having integral tertiary amine groups, the inductive effect of which provides anion retention and release sites capable of taking on exchangeable ions of nitrate, phosphate, and sulfate,

a filler in an amount of from about 36% to about 60% by weight based on the total weight of the plant growth medium dispersed throughout the polyurethane matrix,

the filler comprised of about 69% to about 78% by weight based on the filler of a calcium-hydrogen montmorillonite clay having cation retention and relase sites capable of taking on exchangeable cations of magnesium, potassium, iron and ammonium nitrogen by replacement of calcium and hydrogen ions, and

from about 22% to about 31% by weight based on the filler of plant nutrients and their carriers comprised of salts and compounds at least partly encapsulated by cells of the polyurethane matrix capable of diffusion through membranes of the cells in response to osmotic pressure,

the cations of the nutrients being exchangeably retained on the cation retention sites and the anions of the nutrients being exchangeably retained on the anion retention sites.

3,979,199

TREATMENT OF PHOSPHATE ROCK IN SOIL TO PROVIDE FERTILIZER AND GYPSUM

Dwight D. Collins, Bakersfield, and Fred W. Lauer, Jr., Hillsborough, both of Calif., assignors to Chemsoil Corporation, Bakersfield, Calif.

Continuation of Ser. No. 371,877, June 20, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 557,017

Int. Cl.² C05B *1/00*

U.S. Cl. 71—40 5 Claims

1. The method of providing available phosphate and gypsum to soil comprising:

a. applying in situ to soil to be treated granules consisting essentially of phosphate rock containing phosphorus and calcium, said rock being previously untreated by sulfuric acid; and

b. applying to the soil after application of said granules water into which sulfur dioxide gas has been dissolved whereby to solubilize phosphate values from the rock and to form gypsum in the soil in situ.

3,979,200

N-NITROSO-N-PHOSPHONOMETHYL GLYCINE COMPOUNDS AND HERBICIDAL USE THEREOF

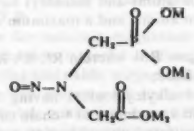
Gerhard H. Alt, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 394,019, Sept. 4, 1973, Pat. No. 3,888,915. This application Apr. 11, 1975, Ser. No. 567,214

Int. Cl.² A01N *9/36*

U.S. Cl. 71—86 4 Claims

1. A herbicidal method which comprises contacting a plant with a herbicidally effective amount of a compound having the formula



wherein M, M_1 and M_2 are each individually hydrogen or a salt-forming cation selected from the class consisting of alkali metals, alkaline earth metals, ammonium, aliphatic ammonium or phenyl ammonium.

3,979,201

CHEMICAL REGULATION OF PLANT GROWTH

Jordan J. Bloomfield, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 275,129, July 26, 1972, Pat. No. 3,873,568. This application Nov. 18, 1974, Ser. No. 524,583

Int. Cl.[2] A01N 9/12

U.S. Cl. 71—91 **7 Claims**

1. A method of regulating the natural growth or development of dicotyledonous plants which comprises treating said plants with an effective plant-regulating amount of 3-thiabicyclo(3.2.0)heptane-6,7-dicarboxylic anhydride 3,3-dioxide.

3,979,202

META-BIFUNCTIONAL BENZENES AND HERBICIDAL COMPOSITIONS

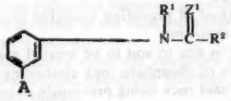
John F. Olin, Ballwin, and Philip C. Hamm, Glendale, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 40,742, May 26, 1970, Pat. No. 3,865,867, which is a continuation-in-part of Ser. No. 647,202, June 19, 1967, abandoned. This application Feb. 6, 1975, Ser. No. 547,539

Int. Cl.[2] A01N 9/12

U.S. Cl. 71—98 **6 Claims**

1. A compound of the formula



wherein

Z^1 is selected from the group consisting of oxygen and sulfur;

R^1 is selected from the group consisting of:

I. Hydrogen,

II. $R^3 - (B)_n$ - wherein B is selected from the group consisting of carbonyl and oxygen; R^3 is selected from the group consisting of alkyl having a maximum of 12 carbon atoms; alkenyl having a maximum of 7 carbon atoms and alkynyl having at least 3 and a maximum of 6 carbon atoms; and n is an integer from 0 to 1; and

III. $R^6O - (R^5O)_m - R^4$ - wherein R^4 is alkylene of not more than 4 carbon atoms; R^5 is alkylene of not more than 4 carbon atoms; R^6 is selected from the group consisting of alkyl and alkenyl of not more than 6 carbon atoms; and m is an integer from 0 to 1;

R^2 is selected from the group consisting of

I. hydrogen,

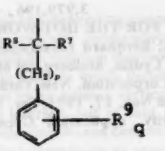
II. hydrocarbyl selected from the group consisting of alkyl having a maximum of 12 carbon atoms, alkenyl having a maximum of 8 carbon atoms, alkynyl having a maximum of 6 carbon atoms and haloalkyl having a maximum of 6 carbon atoms, and a maximum of 3 halogen atoms;

III. $R^6O - (R^5O)_m - R^4$ - wherein R^4, R^5, R^6 and m are as previously defined,

IV. cycloalkyl and alkylcycloalkyl having 3 to 7 ring carbon atoms and a maximum of 4 chain carbon atoms;

V. phenyl and substituted phenyl having a maximum of two substituents said substituent being selected from the group consisting of halogen, and alkyl having a maximum of 4 carbon atoms; and

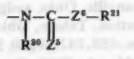
VI. aralkyl of the formula



wherein

R^7 is selected from the group consisting of hydrogen, alkyl having a maximum of 4 carbon atoms, alkenyl having a maximum of 3 carbon atoms and haloalkyl having a maximum of 4 carbon atoms and a maximum of 3 halogen atoms; R^8 is selected from the group consisting of hydrogen, alkyl having a maximum of 4 carbon atoms and haloalkyl having a maximum of 4 carbon atoms and a maximum of 3 halogen atoms; R^9 is independently selected from the group consisting of alkyl having a maximum of 4 carbon atoms, alkoxy having a maximum of 2 carbon atoms, and halogen; p is one of the integers 0 to 2; and q is one of the integers 0 to 2; and

A is

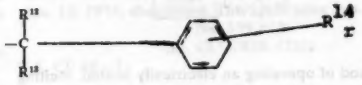


wherein

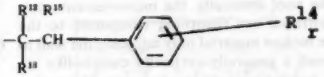
Z^5 and Z^6 are oxygen;

R^{20} is selected from the group consisting of hydrogen, alkyl having a maximum of 6 carbon atoms and alkenyl having a maximum of 6 carbon atoms; and

R^{21} is selected from the group consisting of alkyl having a maximum of 8 carbon atoms, alkenyl having a maximum of 6 carbon atoms, cycloalkyl having from 3 to 7 ring carbon atoms; cyclohexenyl, phenyl, substituted phenyl having a maximum of two substituents said substituents being selected from the group consisting of halogen, nitro and alkyl having a maximum of 4 carbon atoms, the group



and the group



wherein

R^{12} and R^{13} are each independently selected from the group consisting of hydrogen, alkyl having a maximum of 4 carbon atoms, alkenyl having a maximum of 3 carbon atoms, chloroalkyl having a maximum of 3 carbon atoms and a maximum of 3 halogen atoms, chloroalkenyl having a maximum of 3 carbon atoms and 3 halogen atoms, provided that only one of R^{12} and R^{13} can be alkenyl or chloroalkenyl; R^{14} is selected from the group consisting of halogen, alkyl having a maximum of 4 carbon atoms, nitro, alkoxy having a maximum of 3 carbon atoms, R^{15} is selected from the group consisting of alkyl and alkenyl each having a maximum of 4 carbon atoms, provided that R^{15} is other than alkenyl where either R^{12} or R^{13} is alkenyl, and r is one of the integers 0 to 2.

6. A phytotoxic method which comprises contacting a plant with a phytotoxic effective amount of a compound of claim 1.

3,979,203

SULFONAMIDO HERBICIDAL COMPOSITIONS AND PLANT CONTROL METHODS USING THE SAME

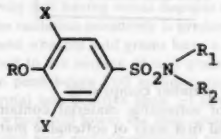
Milon Walker Bullock, Hopewell, and Bryant Leonidas Walworth, Pennington, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 219,123, Jan. 19, 1972. This application Sept. 12, 1974, Ser. No. 505,407

Int. Cl.² A01N 9/14

U.S. Cl. 71—103 8 Claims

1. A method for the control of undesirable plant species comprising contacting said undesirable plant species with a herbicidally effective amount of a compound having the formula:



where X is a member selected from the group H, Br, and Cl; Y is a member selected from the group NO_2, Br, and Cl; R is a member selected from the group H, alkanoyl C_1–C_4 and N-alkylcarbamoyl C_1–C_4; R_1 is a member selected from the group H, alkyl C_1–C_6 and alkynyl C_3–C_6; R_2 is a member selected from the group alkyl C_1–C_6 and alkynyl C_1–C_6, with the proviso that when X is H then Y must be NO_2.

3,979,204

PLANT GROWTH REGULANT COMPOSITIONS COMPRISING 2-CYANO-BICYCLO[2,2,1]HEPTANE

Helmut Timmler, Wuppertal, and Klaus Lurssen, Koenigsdorf, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 16, 1974, Ser. No. 533,392

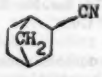
Claims priority, application Germany, Jan. 5, 1974, 2400454

Int. Cl.² A01N 9/20

U.S. Cl. 71—105 9 Claims

1. Plant growth regulating composition which consists essentially of a carrier selected from the group consisting of (1) a ground natural mineral or a ground synthetic mineral solid carrier containing a surface-active agent selected from the group consisting of non-ionic and anionic emulsifiers, dispersants and foam forming agents and mixtures of such agents and (2) a liquid carrier selected from the group consisting of aromatic hydrocarbons, chlorinated aromatic or aliphatic hydrocarbons, aliphatic hydrocarbons, ethers, esters, ketones, strongly polar solvents and water and containing a surface-active agent selected from the group consisting of a non-ionic and anionic emulsifiers, dispersants and foam-forming agents, and mixtures of such agents, and

a 2-cyano-bicyclo[2,2,1]heptane of the formula



(I)

comprising from 0.1 to 95% by weight of the total composition and in amount sufficient to increase the yield of crop plants.

3,979,205

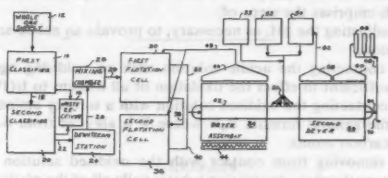
METAL RECOVERY METHOD

Fritz W. Wanzenberg, 9 Campbell Lane, Larchmont, N.Y. 10538

Continuation-in-part of Ser. No. 132,061, April 7, 1971, Pat. No. 3,819,363, which is a continuation-in-part of Ser. No. 49,455, June 24, 1970, abandoned. This application June 19, 1974, Ser. No. 480,965

Int. Cl.² C22D 7/00

U.S. Cl. 75—10 R 34 Claims



1. A method of treating noble metal containing sea carbonaceous ore having therein noble metal containing composite organic materials and gangue fractions, including sand and shells, to produce therefrom elemental noble metals, noble metal oxides and other noble metal compounds, said method comprising:

stripping said noble metal containing composite organic materials, having therein naturally occurring carbonaceous reducing agent components, from said gangue fractions to form a carbonaceous concentrate;

treating said noble metal containing composite organic materials with a strong oxidizing agent in amounts substantially stoichiometrically balanced with said carbonaceous reducing agent components of said composite organic materials;

heating said treated composite materials until said materials autogeneously ignite;

allowing complete combustion of said carbonaceous reducing agent components and said strong oxidizing agent in said treated composite materials, whereby the energy released by said autogeneous ignition is sufficient to drive all said noble elemental metals, noble metal oxides and other noble metal compounds into the vapor phase to produce thereby a particulate plasma with solid non-combustible residues remaining in the form of an ash; and

recovering from the vapor phase said noble elemental metals, noble metal oxides and other noble metal compounds.

3,979,206

PROCESS FOR THE PREPARATION OF MAGNESIUM

Servaas Middelhoek, Arnhem, and Diederich J. Baan, Ede, both of Netherlands, assignors to Billiton Research B.V., Netherlands

Filed Jan. 14, 1975, Ser. No. 540,921

Claims priority, application Netherlands, Feb. 18, 1974, 7402177

Int. Cl.² C22B 26/22

U.S. Cl. 75—67 R 14 Claims

1. A process for reducing magnesium oxide in an oxidic magnesium-containing material to form magnesium which comprises reacting said oxidic magnesium-containing material with carbon, in the presence of, and in admixture with, an additional material consisting essentially of iron, cobalt, nickel, chromium or manganese metal, and mixtures thereof, at a temperature between 1000°C. and 2000°C., whereby the carbon is consumed reducing magnesium oxide to magnesium, the additional material remaining as the metal, after the reaction.

3,979,207

REFINING OF NOBLE GROUP METALS

John James MacGregor, London, England, assignor to Mathey Rustenburg Refiners (Proprietary), Johannesburg, South Africa

Filed Dec. 10, 1974, Ser. No. 531,371

Claims priority, application United Kingdom, Dec. 13, 1973, 57793/73

Int. Cl.² C22B *11/04*

U.S. Cl. 75—121 35 Claims

1. A process for the separation and purification of platinum, rhodium and iridium present as salts in an aqueous solution which cmprises the steps of:

a. adjusting the pH, as necessary, to provide an acidic solution;

b. contacting the acidic solution with an oxidising agent sufficient to effect the oxidation of all iridium to Ir(IV);

c. contacting the oxidised solution with a tertiary amine of the general formula R_3N where R is alkyl of from 6–12 carbon atoms;

d. removing from contact with the oxidised solution an organic phase containing substantially all of the platinum and iridium present in association with the nitrogen-containing organic compound used in step (c);

e. removing the iridium from the organic phase by contacting with an aqueous solution of a reducing agent leaving substantially all of the platinum in the organic phase; and

f. removing the platinum from the organic phase with an aqueous stripping solution.

3,979,208

DUCTILE ALUMINUM BRONZE ALLOY AND ARTICLE

Norman Coupe Ashton, Huddersfield, England, assignor to N. C. Ashton Limited, Huddersfield, England

Continuation-in-part of Ser. No. 394,625, Sept. 6, 1973, abandoned. This application Sept. 11, 1974, Ser. No. 505,019

Int. Cl.² C22C *9/00*

U.S. Cl. 75—154 7 Claims

7. An integral corrosion resistant screw threaded securing member of improved ductility formed from an aluminum bronze alloy consisting essentially by weight of 5% to 8% aluminum; 0.1% to 2% cobalt; 0.10% to 0.25% tin; not more than 0.10% iron; and the balance of copper and impurities associated with copper; and further characterized by having been cold worked at least 15%.

3,979,209

DUCTILE TUNGSTEN-NICKEL ALLOY AND METHOD FOR MAKING SAME

William B. Snyder, Jr., Knoxville, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 18, 1975, Ser. No. 550,677

Int. Cl.² B22F *1/00, 1/02*

U.S. Cl. 75—227 3 Claims

1. A method of preparing a tungsten-nickel alloy of a ductility characterized by a tensile elongation in the range of about 1.0 to about 20.0 percent in 1 inch at 25°C., comprising the steps of forming a powder mixture consisting of tungsten and about 0.5 to about 10 weight percent nickel, pressing the mixture into a compact, heating the compact in a hydrogen atmosphere to a temperature above 1510°C. to effect liquid-phase sintering of the powder, heating the compact in an inert atmosphere at a temperature above approximately 970°C. to stabilize the matrix phase, and thereafter quenching the compact to room temperature with sufficient rapidity for maintaining the matrix phase in a metastable, face-centered cubic, solid solution of tungsten in nickel while inhibiting the formation of the intermetallic WNi_4.

3,979,210

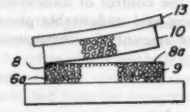
MIGRATION IMAGING MEMBER EMPLOYING A SURFACE SKIN

David A. Buckley, Rochester, and Frank G. Belli, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 22, 1974, Ser. No. 499,716

Int. Cl.² G03G *5/00*

U.S. Cl. 96—1.5 10 Claims



1. An imaging member comprising:

a first layer of softenable material containing migration material, said first layer of softenable material overlying a second layer of softenable material, said second layer of softenable material being substantially free of migration material, said softenable material being either electrically photosensitive or substantially electrically insulating, at least one of said layers of softenable material containing a surface skin located at the entire surface of at least one of said softenable layers and at the interface between said layers of softenable material, said surface skin formed by exposing said surface of at least one of said layers of softenable material to hardening radiation sufficient to form said surface skin having a thickness from about 0.01 to about 0.5 micron, said layers of softenable material capable of being softened sufficiently to allow migration of migration material in depth in said layers of softenable material, and through the interface thereof.

3,979,211

VESICULAR IMAGE TRANSFER PROCESS

Saul W. Chaikin, Menlo Park, Calif., assignor to Xidex Corporation, Sunnyvale, Calif.

Filed Feb. 11, 1974, Ser. No. 441,094

Int. Cl.² G03C *5/54, 5/18, 5/34*

U.S. Cl. 96—29 R 10 Claims

1. A method for transferring a photographic image comprising: exposing a vesicular film having a vehicle and light sensitive diazonium salt uniformly dispersed therein to actinic radiation to form a latent nitrogen gas image in said vehicle of a preselected master image; promptly directly physically contacting the vehicle of said vesicular film while it still contains said latent image with a sensitizer-free vesicular film vehicle having a nitrogen permeability not substantially lower than vehicle of said vesicular film; and applying sufficient heat and uniform pressure to cause an image-forming amount of said nitrogen gas to be transferred to said sensitizer-free vesicular film vehicle as a latent image; said heat being below the amount which causes vesiculation, subjecting said vesicular film vehicle after said gas is transferred to sufficient heat to develop a vesicular image within said vesicular film vehicle.

3,979,212

LAMINATED LITHOGRAPHIC PRINTING PLATE

John E. Peters, and Vincent A. Pagliaro, both of Racine, Wis., assignors to Printing Developments, Inc., New York, N.Y.

Filed Oct. 4, 1974, Ser. No. 512,002

Int. Cl.² G03C *1/94*

U.S. Cl. 96—86 R 9 Claims

1. An inexpensive, strong, durable, noncracking, high fidelity lithographic printing plate which comprises a laminated base or substrate formed of a soft temper aluminum sheet laminated to a nonstainless steel sheet with an adhesive.

3,979,213

SPECTRALLY SENSITIZED SILVER HALIDE EMULSION CONTAINING AN INTERNAL METAL DOPANT

Paul B. Gilman, Jr.; Francis J. Evans, and Gene L. Oliver, all of Kodak Park Works, Rochester, N.Y. 14650

Continuation-in-part of Ser. No. 263,899, June 19, 1972, abandoned, which is a continuation of Ser. No. 56,702, July 20, 1970, abandoned. This application Aug. 19, 1974, Ser. No. 498,837

Int. Cl.² G03C *1/28, 1/02*

U.S. Cl. 96—108 **8 Claims**

1. A photographic element comprising a support and at least one layer containing a negative-working silver halide emulsion comprising silver halide grains substantially free of surface sensitivity and having metal dopants occluded therein and wherein the radiation sensitivity is predominantly internal to said grains and wherein said grains have a spectral sensitizing dye adsorbed to the surface of said grains having a radiation absorption peak below 700 millimicrons and a cathodic halfwave potential less positive than −1.0 volt present in a concentration which will lower the blue-speed sensitivity of a control sulfur and gold surface-sensitized silver bromoiodide emulsion, wherein the halide is 6 mole percent iodide, of similar average grain size at least 0.3 log E when developed for 3 minutes at 20°C in Kodak Developer D-19 consisting essentially of:

N-methyl-p-aminophenol sulfate	2.0 g
sodium sulfite, desiccated	90.0 g
hydroquinone	8.0 g
sodium carbonate, monohydrated	52.5 g
potassium bromide	5.0 g
water to	1.0 liter.

3,979,214

SINTERED ALUMINA BODY

Louis J. Trostel, Jr., Princeton, Mass., assignor to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 345,550, March 28, 1973, abandoned. This application May 5, 1975, Ser. No. 574,448

Int. Cl.² C04B *35/56, 35/48, 35/70*

U.S. Cl. 106—44 **6 Claims**

1. A monolithic refractory shape consisting essentially of bonded particles of alumina and silicon carbide containing from 15 to 44% by weight of silicon carbide grains, 56 to 85% alumina grains, at least 25% of the alumina grains being finer than 50 microns in size, at least 8% of the body by weight is alumina grains finer than 10 microns in size, and at least 75% of the silicon carbide grains being coarser than 100 mesh.

3,979,215

REFRACTORY ARTICLES AND METHODS OF PRODUCING SAME

Harold Garton Emblem, Grappenhall, near Warrington, and Leslie Edward Shiel, Newcastle-upon-Tyne, both of England, assignors to Zirconal Processes Limited, Bromley, England

Division of Ser. No. 256,728, May 25, 1972, abandoned. This application July 1, 1974, Ser. No. 484,399

Int. Cl.² C04B *35/14*

U.S. Cl. 106—55 **21 Claims**

1. A process for producing a shaped refractory article comprising:

a. forming a gelable binding solution by hydrolyzing together under acidic conditions (1) an organic silicate and (2) a salt of a metal selected from the group consisting of calcium, magnesium, zinc, aluminum, zirconium and chromium, said hydrolyzing being carried out in an aqueous solvent for the silicate and the salt;

b. mixing with the binding solution so formed a refractory powder and an alkaline gelation accelerator to form a slurry;

c. forming a self-supporting body by molding the slurry into a desired shape and allowing the binding solution to gel; and

d. firing the resulting body.

3,979,216

LOW THERMAL EXPANSION COEFFICIENT SYNTHETIC CORDIERITE-CONTAINING CERAMIC BODIES AND METHOD FOR PRODUCING SAME

Carl W. Fritsch, Jr., Dushore, and Sergej-Tomislav Buljan, Towanda, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 27, 1975, Ser. No. 562,773

Int. Cl.² C04B *35/20*

U.S. Cl. 106—62 **10 Claims**

1. A polycrystalline cordierite-containing ceramic body of magnesium aluminum silicate having the composition in weight percent within the range of 13 to 16 percent magnesium oxide, 30 to 36 percent aluminum oxide, and 49 to 54 percent silicon dioxide, the body consisting essentially of at least 90 percent by weight of crystalline phase, remainder glassy phase, the body characterized by a microstructure having microcracks at least 3 micrometers in length and a microcrack occurrence frequency of at least 0.02 per micrometer, and further characterized by a thermal expansion within the temperature range of 25° to 800°C of up to 1100 parts per million.

5. A process for producing a polycrystalline cordierite containing magnesium aluminum silicate ceramic body, the body consisting essentially of at least 90% by weight of crystalline phase, remainder glassy phase, the body characterized by a microstructure having microcracks at least 3 micrometers in length and a microcrack occurrence frequency of at least 0.02 per micrometer, and further characterized by having a thermal expansion within the range of 25° to 800°C of up to 1100 parts per million, the process comprising:

a. combining talc, ball clay and alumina containing starting materials in amounts to achieve a sintered ceramic body having the composition in weight percent 13 to 16 percent MgO, 30 to 36 percent Al_2O_3, and 49 to 54 percent SiO_2, the starting materials containing less than about 600 parts per million total of the alkaline earths selected from the group consisting of calcium, strontium and barium, less than about 6,000 parts per million total of the alkali metals selected from the group consisting of lithium, sodium and potassium, less than about 0.5 weight percent iron and less than about 1 weight percent titanium,

b. ball milling the combined starting materials,

c. consolidating the milled starting materials into a green ceramic body of a desired shape,

d. heating the green body at a rate of up to 350°C per hour to a temperature within the range of about 1350° to 1425°C,

e. maintaining the temperature of the green body within the above range for from ½ hour to 1 hour at the higher temperature, and for at least 6 hours at the lower temperature, thereby to convert the green body to a sintered polycrystalline cordierite-containing ceramic body, and

f. cooling the sintered body at a rate of up to 500°C per hour down to a temperature below 1,000°C.

3,979,217

LIGHTWEIGHT CELLULAR CEMENT COMPOSITIONS AND METHODS OF CASTING THE SAME

David L. Sutton, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 365,918, June 1, 1973, abandoned. This application May 5, 1975, Ser. No. 574,226

Int. Cl.² C04B 21/00

U.S. Cl. 106—88 2 Claims

1. A method of producing an integral lightweight high strength cement composition having at least one high strength densified layer adjacent at least on lightweight cellular layer comprising mixing hydraulic cement; water added in an amount of about 23–80% by weight of said dry cement; a foam stabilizer added in an amount 0.25–5% by weight of dry cement selected from organic surfactants, inorganic lamellar particulate and mixtures thereof; a dispersing agent selected and added to facilitate formation of a high strength densified layer prior to setting of said composition; and air added in an amount sufficient to reduce density to less than about 80 pounds per cubic foot; forming said cement composition into the desired shape; positioning an air and water permeable material adjacent the cement composition; promoting and controlling formation of said high strength densified layer by establishing a pressure differential across said permeable material causing air and water to flow from the layer to be densified and allowing said composition to set.

3,979,218

PROCESS FOR PREPARING CEMENT

Wolfgang Hesse, Wiesbaden; Guido Lorentz, Frankfurt am Main-Hochst, and Klaus Rauhut, Wiesbaden, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 5, 1975, Ser. No. 555,587

Claims priority, application Germany, Mar. 9, 1974, 2411297

Int. Cl.² C04B 7/02

U.S. Cl. 106—90 14 Claims

1. A process for the preparation of an acid-hardenable cement composition yielding alkali-resistant cements which comprises mixing a) a solution of a resol resin derived from at least one methylol phenol partially etherified at the phenolic hydroxy group and at least one compound selected from the group consisting of a methylol alkylphenol and a methylol aralkylphenol, both partially etherified at the phenolic hydroxy group in a reactive solvent which increases its molecular size by self-condensation or by reactionn with the resin under setting conditions, the basic phenol components having at least two positions reactive with formaldehyde and the resin being freed from alkaline catalysts used in its preparation, with b) a cement powder containing an acid setting catalyst.

3,979,219

WOOD FINISH REMOVER

Edward H. Chang, Burnsville; William V. Block, Minneapolis, and Mark L. Gruss, Excelsior, all of Minn., assignors to Fremont Industries, Inc., Shakopee, Minn.

Filed Mar. 6, 1975, Ser. No. 555,862

Int. Cl.² B08B 3/04; C08L 91/06

U.S. Cl. 106—271 3 Claims

1. A film stripping composition for cohesive finish films consisting essentially of from 1% to 11% by weight of hydroxyacetic acid, 3.5% to 11% by weight of a vapor pressure depressant consisting of a mixture of paraffin and toluene; from 5% to 20% by weight of methanol, and from 3% to 15% by weight of an anionic detergent selected from the group consisting of linear alkyl benzenesulfonic acid with an alkyl chain length of from 10 to 13 carbon atoms; from about 0.5% to about 5% water; balance methylene chloride.

3,979,220

METHOD FOR TREATING AND RINSING METAL ARTICLES

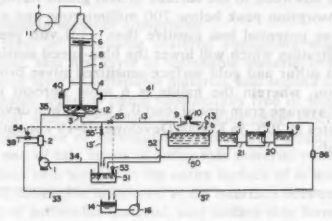
Koichi Ishiyama, Yokohama; Yuji Sakata, Omiya, and Ikuo Wada, Fujisawa, all of Japan, assignors to Ebara Udylite Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1974, Ser. No. 519,707

Claims priority, application Japan, Nov. 15, 1973, 48-128635; Nov. 22, 1973, 48-131483; Jan. 25, 1974, 49-10643

Int. Cl.² B08B 7/04; C23G 1/36

U.S. Cl. 134—10 7 Claims



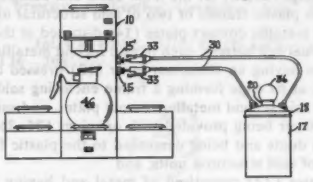
1. In a process wherein articles are to be treated in a surface-treatment tank containing process solution having chemical-surface-treating agents therein and washed with wash water in a plurality of series-connected water-washing tanks, the improvement comprising the steps of introducing condensate water at a constant rate from a condensate-storage tank into the water-washing tank furthest from said surface-treatment tank, successively treating said articles in said surface-treatment tank and washing said articles in said series-connected water-washing tanks, transferring said wash water in a direction counter-current to the movement of said articles through said water-washing tanks from the tank furthest from said surface-treatment tank to the tank nearest to said surface-treatment tank, transferring overflow process solution from said surface-treatment tank and overflow water from said water-washing tank nearest said surface-treatment tank to a first receiving tank, transferring process solution from said receiving tank through a heat-exchanger and thence to a concentrator, subjecting said process solution to a concentration treatment in said concentrator, returning concentrated process solution to said surface-treatment tank and to said receiving tank in a controlled ratio, sensing the liquid level in said receiving tank and adjusting the heat input to said heat-exchanger in response to said liquid level, an increase in liquid level calling for an increase in heat input, supplying said heat input as condensing steam by way of said heat-exchanger to cause evaporation of water in said concentrator, transferring the condensate from said heat-exchanger to said condensate storage tank, collecting any mist and harmful gases arising from said surface-treatment tank and subjecting said mist and gases to counter-current contact with process solution in said concentrator to recover active constituents of said process solution from said mist and gases, the extent of concentration being related to the quantity of wash-water introduced into said water-washing tank and the quantity of condensate formed in said heat-exchanger so that said tanks and concentrator may function as a closed system without discharge of surface-treatment ingredients or waste water to the exterior of the system.

3,979,221

WATER SYSTEM DELIMING APPARATUS

Melvin F. Roberts, Chicago, Ill., assignor to Bloomfield Industries, Inc., Chicago, Ill.

Filed Feb. 28, 1975, Ser. No. 554,132
Int. Cl.² B08B 9/02
U.S. Cl. 134—99 7 Claims



1. A portable apparatus for deliming a device such as a coffee brewing machine utilizing in its normal operation a water supply system, comprising

a. a water supply intake line provided by the device to be delimed,

b. means in said intake line providing connections for a detachable secondary line system,

c. a detachable secondary line system connectable into said intake line,

d. a refillable sealable tank in said secondary line system for containing a lime solvent for introduction into said intake line,

e. means detachably connecting said secondary line system and said tank in open communication to said intake line, with the lime solvent in said tank introduced under water pressure through said secondary line system into the apparatus, and

f. a directional valve means in said secondary line system automatically operable by the difference in water pressure between said secondary line system and said intake line so as to cooperate with said last-named means for directing the water supply into and out of said tank prior to its introduction into the device to be delimed.

3,979,222

METHOD AND DEVICE FOR CONNECTING ELEMENTS OF A FORCED FLOW ELECTROCHEMICAL STORAGE CELL

Jean-Paul Pompon, Vitry-sur-Seine, France, assignor to Compagnie Generale d'Electricite, Paris Cedex, France

Filed Mar. 19, 1975, Ser. No. 559,948
Claims priority, application France, Apr. 5, 1974, 74.12152
Int. Cl.² H01M 10/00
U.S. Cl. 429—81 5 Claims

1. In an electrochemical storage cell comprising a plurality of elementary cells each having negative and positive terminals at either end of the cell and being of the type in which an alkaline electrolyte including in suspension a metal suitable for supplying on discharge of the cell a compound soluble in the electrolyte is made to flow within the elementary cells, said elementary cells each having a negative collector grid in contact with said electrolyte, a catalytic active layer and a positive collector grid, said negative and positive collector grids being connected to said negative and positive terminals, respectively, the method of connecting said plurality of elementary cells in series to form said storage cell comprising the steps of

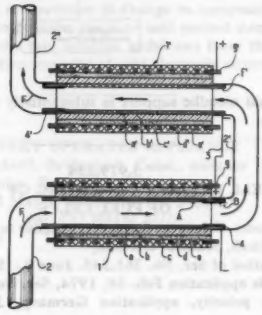
hydraulically feeding each of said elementary cells in series with said electrolyte,

electrically connecting said elementary cells in series, and

electrically insulating the negative terminal of each elementary cell located hydraulically the nearest to the following elementary cell having a higher potential so that the interference transfer of charges resulting from connecting said elementary cells in series can be effected only by ionic conduction in the electrolyte flowing between said elementary cells.

2. An electrochemical storage cell comprising:

a plurality of elementary cells each having negative and positive terminals at either end of the cell and being of the type in which an alkaline electrolyte including in suspension a metal for supplying on discharge of the cell a compound soluble in the electrolyte is made to flow within the elementary cells, said elementary cells each having a negative collector grid in contact with said electrolyte, a catalytic active layer and a positive collector grid, said negative and positive collector grids being connected to said negative and positive terminals, respectively,



means for hydraulically feeding each of said elementary cells in series with said electrolyte,

means connected to said negative and positive terminals for electrically connecting said elementary cells in series, and

insulating means on the negative terminal of each elementary cell located hydraulically the nearest to the following elementary cell having a higher potential for electrically insulating said negative terminal from said electrolyte so that the interference transfer of charges resulting from connecting said elementary cells in series can be effected only by ionic conduction in the electrolyte flowing between said elementary cells.

3,979,223

ELECTROCHEMICAL IMPREGNATION OF ELECTRODE FOR RECHARGEABLE CELL

Hanns H. Kroger, Gainesville; Stuart F. Acree, Archer, and Allen P. Akridge, Gainesville, all of Fla., assignors to General Electric Company, Columbus, Ohio

Continuation of Ser. No. 120,504, March 3, 1971, abandoned.
This application Mar. 30, 1973, Ser. No. 346,633
Int. Cl.² H01M 4/22
U.S. Cl. 204—24 2 Claims

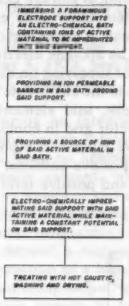
1. A process for preparing by electrodeposition electrodes for use as positive electrodes for nickel-cadmium, alkaline electrolyte, rechargeable cells, said process comprising the steps of:

a. immersing a porous metallic support in an acidic electrolyte bath comprising solutions of nickel nitrate and cobalt nitrate in predetermined weight proportion to provide a weight ratio of nickel to cobalt of about 9:1;

b. maintaining, with the use of at least one consumable electrode comprised of a nickel-cobalt alloy, the weight ratio of nickel to cobalt substantially constant by supplying ions of nickel and cobalt in said bath in substantially the same weight-ratio; and

c. applying a constant electric potential between said metal-

lic support and said at least one consumable electrode to deposit the hydroxides of nickel and cobalt in the pores


IMMERSING A FORAMINOUS ELECTRODE SUPPORT INTO AN ELECTRO-CHEMICAL BATH CONTAINING IONS OF ACTIVE MATERIAL TO BE IMPREGNATED INTO SAID SUPPORT.
PROVIDING AN ION PERMEABLE BARRIER IN SAID BATH AROUND SAID SUPPORT.
PROVIDING A SOURCE OF IONS OF SAID ACTIVE MATERIAL IN SAID BATH.
ELECTRO-CHEMICALLY IMPREGNATING SAID SUPPORT WITH SAID ACTIVE MATERIAL WHILE MAINTAINING A CONSTANT POTENTIAL ON SAID SUPPORT.
TREATING WITH HOT CAUSTIC, WASHING AND DRYING.

of said metallic support in substantially the same weight ratio.

3,979,224

FUEL CELL BATTERY CONSISTING OF A PLURALITY OF FUEL CELLS

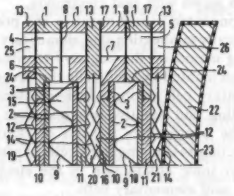
Karl Strasser, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 261,245, June 9, 1972, abandoned. This application Feb. 26, 1974, Ser. No. 446,082

Claims priority, application Germany, June 11, 1971, 2129187

Int. Cl.² H01M *8/02*

U.S. Cl. 429—18 **7 Claims**



1. A fuel cell battery, comprising a plurality of fuel cells, for reacting gaseous reactants and a liquid electrolyte, each of said fuel cells comprising:

plastic frames (**1**) provided with recesses (**24**) for enclosing each fuel cell;

asbestos diaphragms (**2**) cemented at the rim thereof into said recesses, each diaphragm and plastic frame forming a structural part, two of said structural parts being arranged in mirror-image fashion and having the plastic frames thereof cemented together to form a structural unit;

canals in each of said plastic frames for feeding in and discharging reactants and electrolytic liquid;

main ducts in each of said plastic frames for feeding in and discharging reactants and electrolytic liquid;

a support frame (**9**) disposed between said diaphragms of said structural unit and forming an electrolyte chamber (**15**);

catalytic material in powdered form disposed on the opposite side of each diaphragm from said support frame and forming electrodes (**10** and **11**) for said fuel cells;

spacer screens (**12**) disposed adjacent said catalytic material for supporting said catalytic material adjacent said diaphragms;

the fuel cell battery further comprising:

first metallic contact plates (**14**) disposed between said structural units and contacting said spacer screens, each of said first metallic contact plates having an elastomer layer (**13**) pressed onto said plate at its edge forming a frame enclosing said edge of each of said first metallic contact plates, said elastomer layer being provided with openings (**25,26**) for the main ducts and being cemented to the plastic frames of two of said structural units;

second metallic contact plates (**14**) disposed at the ends of said fuel cell battery, each of said second metallic contact plates having an elastomer layer (**13**) pressed onto said plate at its edge forming a frame enclosing said edge of each said second metallic contact plates, and said elastomer layer being provided with openings (**25, 26**) for the main ducts and being cemented to the plastic frames of two of said structural units; and

end plates (**22**) comprised of metal and having a plastic coating (**23**) disposed at the ends of the battery, each of said end plates being disposed adjacent one of said second metallic contact plates, said second metallic contact plates each being disposed between a structural unit and one of said end plates.

3,979,225

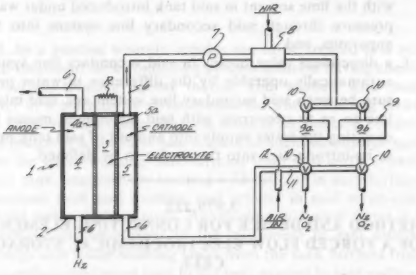
NITROGEN DIOXIDE REGENERATIVE FUEL CELL

Stanley W. Smith, Vernon, Conn., and Lawrence J. Bregoli, Southwick, Mass., assignors to United Technologies Corporation, East Hartford, Conn.

Filed Dec. 13, 1974, Ser. No. 532,568

Int. Cl.² H01M *8/06*

U.S. Cl. 429—17 **3 Claims**



1. In a method for operating a fuel cell cathode which comprises passing an oxidant gas stream into contact with an electrolyte on an electrode connected to an external circuit and causing the chemical reduction of the oxidant gas stream to occur with associated transfer of electrons in the external circuit, the improvement which comprises:

a. using as the oxidant gas stream a mixture comprising gaseous nitrogen dioxide and gaseous oxygen in an amount sufficient to oxidize a substantial portion of the nitric oxide formed by the reduction of nitrogen dioxide back to nitrogen dioxide during passage through the fuel cell cathode;

b. exhausting said oxidant gas stream from the fuel cell cathode;

c. introducing air into said exhaust gas stream;

d. separating the nitrogen dioxide in said gas stream from the remaining components of the gas stream formed according to step (c);

e. introducing air into the nitrogen dioxide stream obtained according to step (d); and,

f. introducing the gas stream produced by step (e) into the fuel cell cathode and repeating steps (a) through (f) continuously to provide recirculation and regeneration of said oxidant gas stream.

3,979,226

THERMAL GENERATOR WITH PARALLEL CIRCUITS

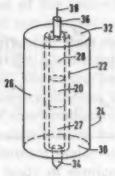
Theodor Renner, Nurnberg-Eibach; Dieter Falkenberg; Gerhard Rittmayer, both of Erlangen, and Georg Grübmuller, Nurnberg, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 13, 1974, Ser. No. 496,997

Claims priority, application Germany, Aug. 30, 1973, 2343840

Int. Cl.² H01L *35/10*; G21H *1/10*

U.S. Cl. 136—208 3 Claims



1. A thermal generator including a plurality of film thermocouples deposited on an insulating carrier in the form of a winding which comprises:

a. at least two rows of said thermocouples each arranged on said carrier such that individual thermocouples alternate in polarity along the length of each row and are serially connected to the others in said row; and

b. means for electrically bridging two consecutive thermocouples in one row to two corresponding consecutive thermocouples in a second row, said winding being formed into a cylindrical shape for placement about a correspondingly shaped "heat source", and the length of said bridging means, h, between the pairs of consecutive thermocouples being approximately equal to the axial length of said cylindrical shape.

3,979,227

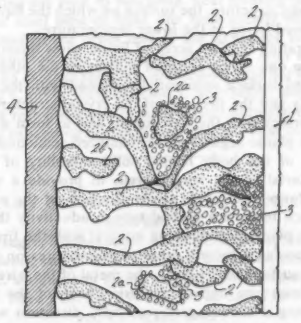
METHOD FOR CATALYZING A FUEL CELL ELECTRODE AND AN ELECTRODE SO PRODUCED

Murray Katz, Newington, and Arthur Kaufman, Bloomfield, both of Conn., assignors to United Technologies Corporation, East Hartford, Conn.

Division of Ser. No. 533,918, Dec. 18, 1974, Pat. No. 3,932,197. This application Jan. 2, 1976, Ser. No. 645,962

Int. Cl.² H01M *4/88*

U.S. Cl. 427—115 4 Claims



1. A process for introducing a soluble, catalyst containing material into a conducting particle, hydrophobic-bonded electrochemical cell electrode which comprises:

a. dissolving said soluble catalyst-containing material in a liquid solution of dissimilar liquids which liquid solution is:

i. capable of wetting the hydrophobic bonding material of the electrode at a first composition range of said liquids,

ii. incapable of wetting the hydrophobic bonding material at a second composition range of said liquids, and

iii. capable of changing from said first composition range to said second composition range on evaporation of said solution;

b. contacting said electrode structure with said soluble catalyst-containing material dissolved in the liquid solution in said first composition range, whereby said solution enters the hydrophobic and hydrophilic regions of said electrode structure, and

c. evaporating said solution to change its composition from said first composition range to said second composition range whereby said solution withdraws from the hydrophobic bonding material of said electrode structure.

3,979,228

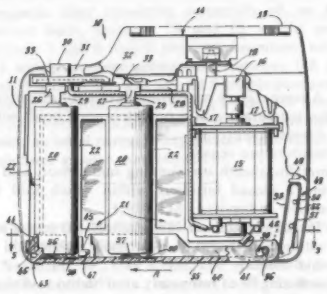
BATTERY OPERATED APPLIANCE

Michael J. Marchetti, Bridgeport, Conn., assignor to Sperry Rand Corporation, Bridgeport, Conn.

Filed May 1, 1975, Ser. No. 573,433

Int. Cl.² H01M *2/10*

U.S. Cl. 429—99 5 Claims



1. In a battery operated appliance,

a. a casing,

b. a compartment within said casing,

c. an opening at one end of said compartment for receiving a plurality of batteries therein,

d. closure means for said compartment opening including,

e. a slide member having elongated slots and being operable to cover the compartment opening,

f. hinge means interconnecting the closure means and the casing and including,

g. pintles on opposite sidewalls of the casing in operative engagement with said slots, and

h. detent means on the closure means and the casing to maintain the slide member in a detented position wherein the slide member covers the compartment opening,

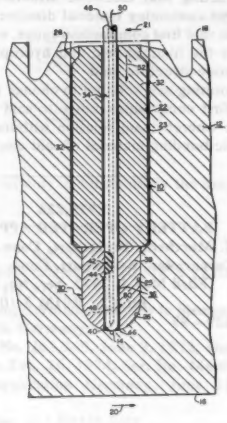
i. said detent means including means permitting slidable movement of the slide member on said pintles along the slots to release the slide member from said detented position prior to pivotal movement of the slide member about the pintles.

3,979,229

TEMPERATURE MEASURING DEVICE HAVING A DEFORMABLE TEMPERATURE SENSING HEAD THEREOF

Serge P. Barton, Wallingford, Pa., and William R. Berry, Camden, N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 20, 1974, Ser. No. 481,270
Int. Cl.[2] H01V 1/04
U.S. Cl. 136—232 6 Claims



1. A temperature measuring device for electrically measuring the temperature at a predetermined point within a body, said device comprising:

a temperature sensor,

a metallic sheath surrounding said sensor, said sheath having a closed terminus within which said temperature sensor is disposed,

an insulating member surrounding said sensor and disposed within said sheath to electrically isolate said sensor from said sheath,

a mounting head intimately attached to said sheath so as to enclose said terminus thereof, while disposing said sensor in a temperature sensing relationship with said predetermined point in said body,

said body having a cavity therein, said cavity terminating in a predetermined shape adjacent said predetermined point,

said mounting head being fabricated of the same material as said body and conforming substantially to said shape of said cavity adjacent said point by deformation of said head to generate a gripping force maintaining said sensor within said cavity and in said temperature sensing relationship with said predetermined point,

a spacer element disposed to completely fill the remainder of said cavity and abutting said mounting head, said spacer completely surrounding said sheath as said sheath extends from its intimate contact with said head to prevent thermal distortion within said cavity, said spacer also being fabricated of the same material as said body,

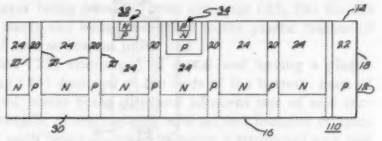
a lip at a surface of said body immediately adjacent said cavity, said lip being deformed onto said spacer and imposing a holding force transmitted by said spacer to said mounting head to augment said gripping force to maintain said sensor in said temperature sensing relationship with said predetermined point within said body.

3,979,230

METHOD OF MAKING ISOLATION GRIDS IN BODIES OF SEMICONDUCTOR MATERIAL

Thomas R. Anthony, and Harvey E. Cline, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 411,022, Oct. 30, 1973, Pat. No. 3,904,442. This application Nov. 1, 1974, Ser. No. 519,913
The portion of the term of this patent subsequent to Sept. 9, 1992, has been disclaimed.
Int. Cl.[2] H01L 21/228
U.S. Cl. 148—1.5 47 Claims



1. A method for making a grid arrangement in a body of semiconductor material of a semiconductor device to produce a plurality of regions of semiconductor material of the body electrically isolated from one another, the method comprising

a. selecting a body of single crystal semiconductor material having a preferred crystallographic structure, two major opposed surfaces being respectively the top and botton surfaces thereof, a preferred planar orientation of at least the top surface, a first selected type conductivity, a selected level of resistivity and having a vertical axis substantially aligned with a first axis of the crystal structure which is substantially perpendicular to the selected surface of the body;

b. forming a first region of second type conductivity in the body substantially parallel to the two major opposed surfaces and having a major surface coextensive with the bottom surface thereof;

c. disposing a first array of metal wires on the selected major surface having the preferred planar orientation, the metal comprising at least one dopant material, the direction of the metal wires being oriented substantially aligned with at least one of the other axes of the crystal structure;

d. heating the body and the first array of metal wires to a preselected elevated temperature sufficient to form an array of liquid wires of metal-rich semiconductor material on the body;

e. establishing a temperature gradient substantially parallel to the vertical axis of the body and the first axis of the crystal structure, the surface on which the liquid wires are formed being at the lower temperature;

f. migrating the first array of liquid wires through the body from one major opposed surface to the other major opposed surface substantially aligned with the axis of the body and the first axis of the crystal structure to at least intersect with the first region and to form a plurality of first planar regions of recrystallized semiconductor material of the body having solid solubility of the dopant material of the wire therein to provide a substantially uniform level of resistivity throughout the entire region which imparts a second type conductivity thereto, each first planar region being integral with the first region;

g. disposing a second array of metal wires on the selected top surface of the body, the metal of the wire comprising at least one dopant, material, each of the metal wires having a second preferred wire direction which is oriented substantially aligned with a second different axis of the crystal structure and at a first preselected angle to the first stable wire direction;

h. heating the body and the second array of metal wires to an elevated temperature sufficient to form an array of

liquid wires of metal-rich semiconductor material on the top surface;

i. establishing a temperature gradient substantially parallel to the vertical axis of the body and the first axis of the crystal structure, the top surface being at the lower temperature; and

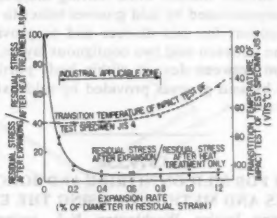
j. migrating the second array of liquid wires through the body from the top to the bottom surface substantially aligned with the vertical axis of the body and the first axis of the crystal structure to at least intersect with the first region and to form a plurality of second planar regions each of which intersects and is integral with the first region and at least one of the plurality of first planar regions, the material of the second planar regions comprising recrystallized semiconductor material of the body having solid solubility of at least the dopant metal of the wire therein to provide a substantially uniform level of resistivity throughout the entire region which imparts a second type conductivity thereto, thereby forming a plurality of unit cells of semiconductor material of the initial body electrically isolated from each mutually adjacent cell and from the bottom major surface of a composite which includes the body of semiconductor material and the first region.

3,979,231

METHOD FOR PRODUCING LARGE DIAMETER STEEL PIPES

Hisashi Gondo; Masatoki Nakayama; Hajime Nakasugi, all of Kisarazu, and Masanobu Yamaguchi, Kimitsu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Feb. 3, 1975, Ser. No. 546,783
Claims priority, application Japan, Feb. 4, 1974, 49-14292
Int. Cl.² C21D *9/08, 9/14*
U.S. Cl. 148—12 R **9 Claims**


RESIDUAL STRESS / RESIDUAL STRESS AFTER EXPANSION / AFTER HEAT TREATMENT, kg/mm²
INDUSTRIAL APPLICABLE ZONE
TRANSITION TEMPERATURE OF IMPACT TEST OF TEST SPECIMEN JIS 4
RESIDUAL STRESS AFTER EXPANSION
RESIDUAL STRESS AFTER HEAT TREATMENT ONLY
EXPANSION RATE
(% OF DIAMETER IN RESIDUAL STRAIN)
TRANSITION TEMPERATURE OF IMPACT TEST (°C)

1. A method for producing a large diameter steel pipe having excellent shape, toughness and tensile strength, comprising subjecting the pipe to descaling, heat treating the pipe by heating the steel pipe at least one time locally successively from one end to the other end of the steel pipe in the axial direction, and forcedly cooling the steel pipe after each heating step at an average thermal conductivity rate not lower than 2000 Kcal/℃ m².hr. between 800℃ and 500℃ and an average cooling rate not lower than 10℃/sec. between 800℃ and 500℃, and expanding the steel pipe after the heat treatment.

3,979,232

MERCURY CADMIUM TELLURIDE ANNEALING PROCEDURE

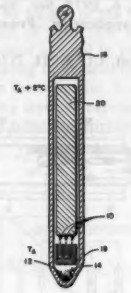
Robert J. Hager, Minneapolis; Joseph L. Schmit, Hopkins; M. Walter Scott, and Ernest L. Stelzer, both of Minnetonka, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 28, 1975, Ser. No. 554,294
Int. Cl.² C22F *1/02*
U.S. Cl. 148—20.3 **14 Claims**

1. A process for controlling the stoichiometry and free-carrier concentration of a mercury cadmium telluride alloy, the process comprising:

providing a body of the alloy; and

heat treating the body in the presence of mercury vapor and cadmium vapor from a mercury vapor source and a cadmium vapor source other than the body and maintaining the body at a temperature for a time of sufficient duration to adjust stoichiometry and free-carrier concentration.



3,979,233

MAGNETIC NI-CR-MN-GE-FE ALLOY

Nobukazu Kuroda, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 480,116, June 17, 1974. This application Jan. 28, 1975, Ser. No. 544,674
Claims priority, application Japan, Feb. 5, 1974, 49-14747
Int. Cl.² C04B *35/00;* **C22C** *19/05*
U.S. Cl. 148—31.55 **1 Claim**

1. A magnetic alloy consisting essentially of, on a 100 weight percent basis, between 79 and 85 weight percent nickel; between 3 and 6 weight percent chromium; between 0.01 and 1 weight percent germanium; between 0.8 and 6 weight percent manganese; and at least 9 weight percent iron, said alloy being characterized by having a coercive force not larger than 0.07 oersteds, a magnetic flux density greater than 6400 Gausses, an intial permeability greater than 4,000 and a specific resistance greater than 60$\mu\Omega$-cm.

3,979,234

PROCESS FOR FABRICATING ARTICLES OF TUNGSTEN-NICKEL-IRON ALLOY

Walter G. Northcutt, Jr., Oak Ridge, and William B. Snyder, Jr., Knoxville, both of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 18, 1975, Ser. No. 614,458
Int. Cl.² B22F *3/16, 3/24*
U.S. Cl. 148—126 **7 Claims**

1. A method of fabricating articles of W—Ni—Fe alloy comprising:

a. providing a uniformly blended mixed powder of 85–96% by weight W and the remainder Ni and Fe in a Ni—Fe weight ratio of 5:5–8:2,

b. pressing said powder into a compact,

c. sintering said compact in reducing atmosphere at a temperature at least 1200℃ and below the liquid phase temperature for a period of time sufficient to provide an article of at least 95% theoretical density,

d. further heating the article to a temperature 0.1°–20℃ above the liquid phase temperature for a period of time sufficient to cause the formation of a liquid phase, yet insufficient to cause slumping of the article,

e. vacuum annealing the article by maintaining the article in a vacuum at 700°–1420℃ for sufficient time to remove entrapped gases, and

f. machining the article to the desired dimensions.

3,979,235

DEPOSITING DOPED MATERIAL ON A SUBSTRATE

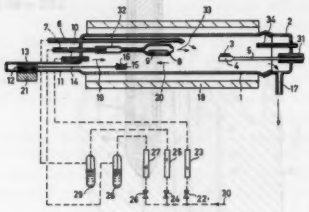
André Boucher, Sevres, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 6, 1975, Ser. No. 538,717

Claims priority, application France, Jan. 10, 1974, 74.00838

Int. Cl.² H01L 7/36

U.S. Cl. 148—175 10 Claims



1. A method of depositing a thin layer containing at least one dopant on a suitable substrate, placed in a reaction chamber, by chemical vapor deposition, said method comprising: passing a flowing reactive gas stream of a carrier gas containing vapors of components capable of reacting to form the deposited layer, placing a source of at least one dopant in non-gaseous form for said layer inside said reaction chamber but outside said flowing reactive gas stream, passing a flowing stream of a gas non-reactive with said source along said source toward the path of said flowing reactive gas stream and controling the resultant concentration of dopant from said source in the resultant deposited layer by moving said source along said path of the flowing stream of the non-reactive gas.

3,979,236

ANTI-EROSIVE, SOLID ROCKET DOUBLE-BASE PROPELLANT COMPOSITIONS

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 579,655, May 21, 1975. This application Dec. 17, 1975, Ser. No. 641,409

Int. Cl.² C06B 45/10

U.S. Cl. 149—19.8 2 Claims

1. In a solid double-base propellant composition comprised of a binder of nitrocellulose, a plasticizer compound selected from the energetic plasticizer nitroglycerin and the less energetic plasticizer triethylene glycol dinitrate, and an optional metal fuel, the improvement to reduce erosive burning which is achieved by incorporating into said solid double-base propellant composition limited percentages from about 0.1 to about 1.0% of a silicate which reduces erosive burning which takes place during the burning phase of said solid double-base propellant composition when said solid double-base propellant composition is encased in a solid propellant rocket motor having a large length-to-diameter ratio, said silicate selected from talc, kaolinite, kaolin, muscovite mica, and feldspar.

3,979,237

DEVICE ISOLATION IN INTEGRATED CIRCUITS

William R. Morcom, Indian Harbour Beach, and Thomas J. Sanders, Indialantic, both of Fla., assignors to Harris Corporation, Cleveland, Ohio

Filed Apr. 24, 1972, Ser. No. 246,982

Int. Cl.² C23F 1/02; H01L 7/50

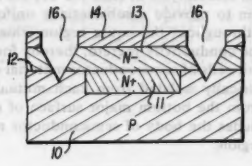
U.S. Cl. 156—3 14 Claims

1. A method of isolating circuit devices in a semiconductor body having first and second substantially parallel major planar surfaces and having at least two contiguous layers of distinct and different conductivity type the major portion of whose boundary lies substantially parallel to said planar surfaces, which comprises

adherently forming on said first planar surface of said semiconductor body a thin film of polish-resistant material,

etching grooves penetrating substantially normal to said first planar surface through said film and to a depth exceeding the depth of said boundary but short of said second planar surface of said semiconductor body, to define portions of said body encompassed by said grooves and in which circuit devices are to be fabricated,

thermally growing an oxide isolation layer on exposed surfaces of said grooves, of insufficient thickness to fill said grooves,



depositing polycrystalline film material on said oxide isolation layer in said grooves in sufficient quantity to fill the remainder of the grooves and overlie said thin film of polish-resistant material,

polishing away the polycrystalline material in excess of that required to fill said grooves until said thin film is encountered to retard further removal and to prevent damage to said first planar surface of said semiconductor body, and

fabricating circuit devices in said body adjacent said first planar surface thereof while leaving the portion of said body unpenetrated by said grooves intact to constitute a rigid support for said devices and to provide junction isolation between said two contiguous layers, with lateral isolation between devices within body portions encompassed by said grooves provided by said oxide isolation layer.

3,979,238

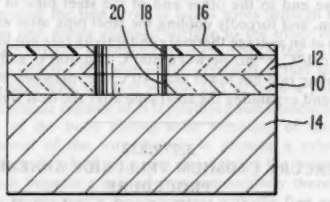
ETCHANT FOR SILICON NITRIDE AND BOROSILICATE GLASSES AND METHOD OF USING THE ETCHANT

Henry Wayne Justice, Washington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 14, 1975, Ser. No. 577,606

Int. Cl.² C03C 15/00; C09K 13/08, 13/06

U.S. Cl. 156—3 10 Claims



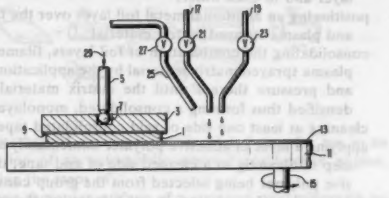
4. A method of etching silicon nitride and borosilicate glasses comprising contacting said materials with an etchant consisting essentially of 75 to 25% by volume of phosphoric acid, 25 to 75% by volume of glycerine and fluoboric acid in the amount of 1 to 6% by volume of the mixture of phosphoric acid and glycerine.

3,979,239

PROCESS FOR CHEMICAL-MECHANICAL POLISHING OF III-V SEMICONDUCTOR MATERIALS

Robert J. Walsh, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 30, 1974, Ser. No. 537,478
Int. Cl.² H01L 21/304
U.S. Cl. 156—4 17 Claims



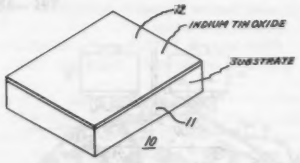
1. A process for polishing a surface of a III - V semiconductor compound, comprising mechanically polishing said surface while applying thereto in an acid environment an etchant concentration of an aqueous solution of a compound which yields free chlorine under acid conditions.

3,979,240

METHOD OF ETCHING INDIUM TIN OXIDE

Mario Ghezzo, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 2, 1975, Ser. No. 573,843
Int. Cl.² C23F 1/02
U.S. Cl. 156—8 13 Claims



1. A method of etching a first pattern in a layer of indium tin oxide on a surface of a substrate comprising

applying a coating of photoresist material over the exposed surface of said layer of indium tin oxide,

forming in said coating a hardened pattern identical to said first pattern and exposing said layer of indium tin oxide unmasked by said hardened pattern,

immersing said substrate with said hardened photoresist thereon in a solution of hydrobromic acid for a time sufficient to etch away indium tin oxide unmasked by said hardened photoresist,

removing said hardened photoresist from said layer of indium tin oxide.

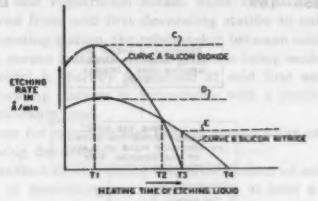
3,979,241

METHOD OF ETCHING FILMS OF SILICON NITRIDE AND SILICON DIOXIDE

Kazuo Maeda, Chigasaki, and Bunya Matsui, Kawasaki, both of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

Continuation of Ser. No. 887,575, Dec. 23, 1969, abandoned.
This application Mar. 29, 1973, Ser. No. 346,095
Claims priority, application Japan, Dec. 28, 1968, 44-44177
Int. Cl.² H01L 21/302, 21/316
U.S. Cl. 156—13 4 Claims

2. A method of manufacture of a semiconductor device having a semiconductor substrate, said method comprising the steps of heating an alcohol selected from the group consisting of ethylene glycol, polyethylene glycol, glycerine, polymethylene glycol, ethylene chlorohydrin, pinacol and ethylene glycol monomethyl ether; dissolving ammonium fluoride in the amount of 2 to 50% by weight of the total solution or alkali fluoride in the amount of 5 to 50% by weight of the total solution in the polyvalent alcohol to produce an etching liquid; forming an insulating layer selected from silicon nitride and silicon dioxide on the substrate; forming a window selectively on said insulating layer to expose a part of the surface of said semiconductor substrate; forming an aluminum wiring



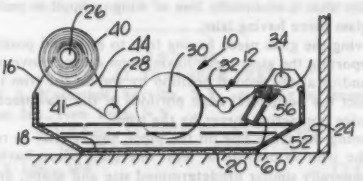
layer conductively contacting the surface of the semiconductor substrate within said window and extending onto the surface of said insulating layers; forming an upper insulating layer selected from silicon nitride and silicon dioxide on the wiring layer and said insulating layer; forming a mask for producing a window on a desired portion on an aluminum wiring layer of said upper insulating layer; immersing the semiconductor substrate and the layers thereon in the etching liquid while heating the etching liquid for a period of time before the etching rate of silicon dioxide becomes equal to the etching rate of silicon nitride thereby etching an opening through the upper insulating layer to expose the aluminum wiring layer.

3,979,242

WALLPAPER DISPENSER AND METHOD OF OPERATION

Leo Holland; Joseph P. Holland, and Alvina Holland, all of Westwood, N.J., assignors to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed June 18, 1975, Ser. No. 588,033
Int. Cl.² E04F 13/20
U.S. Cl. 156—71 5 Claims



1. A wallpaper dispenser apparatus comprising: a housing, means on said housing for rotatably mounting a roll of wallpaper, a reservoir for paste formed in said housing, applicator means communicating with said reservoir, said applicator means positioned for receiving wallpaper from said mounting means, brush means positioned in said housing to act on wallpaper coming from said applicator means for removing excess paste from said wallpaper, wherein said housing has a base adapted to rest on the floor as wallpaper is pulled from said dispenser, said mounting means for said roll of wallpaper being positioned proximate said base in order that said roll of wallpaper may be located at the base of a wall to which said wallpaper is to be applied, said dispenser being configured to enable said wallpaper to be pulled vertically upward from said dispenser while being unrolled from said mounting means and

passed by said applicator means, said applicator means being configured for applying paste to the side of said vertically upward directed wallpaper which faces said wall.

3,979,243

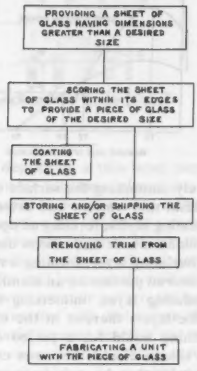
METHOD OF MAINTAINING EDGE STRENGTH OF A PIECE OF GLASS

Robert P. DeTorre, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 438,096, Jan. 30, 1974. This application Mar. 31, 1975, Ser. No. 565,922

Int. Cl.[2] C03C *27/06;* **B26D** *3/08*

U.S. Cl. 156—109 **13 Claims**


PROVIDING A SHEET OF GLASS HAVING DIMENSIONS GREATER THAN A DESIRED SIZE
SCORING THE SHEET OF GLASS WITHIN ITS EDGES TO PROVIDE A PIECE OF GLASS OF THE DESIRED SIZE
COATING THE SHEET OF GLASS
STORING AND/OR SHIPPING THE SHEET OF GLASS
REMOVING TRIM FROM THE SHEET OF GLASS
FABRICATING A UNIT WITH THE PIECE OF GLASS

1. In a method of fabricating a multiple glazed unit wherein the method includes the steps of providing at least two pieces of glass each having generally similar predetermined size and shape; providing a spacer between the two pieces to provide a compartment therebetween; and hermetically sealing the edges of the glass pieces, the improvement comprising the steps of:

providing at least one sheet of glass having at least one peripheral dimension greater than a peripheral dimension of a one of the pieces and one major surface having a surface area greater than the surface area of one major surface of the one of the pieces;

scoring the at least one sheet at a first position with a score line that is essentially free of wing or spall to provide a glass piece having trim;

moving the glass piece having trim to a second position;

supporting the glass piece having trim during movement to and/or at the second position by way of the trim to protect the peripheral edge portions of the glas piece from edge contacting forces by the trim;

running the score line on the piece having trim to remove the trim to provide at least one glass piece having the generally similar predetermined size and shape; and

practicing the hermetically sealing step.

3,979,244

RESIN BONDED COMPOSITE ARTICLES AND PROCESS FOR FABRICATION THEREOF

Richard Charles Novak, Glastonbury, and Roscoe Adams Pike, Simsbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 446,890, Feb. 28, 1974, Pat. No. 3,915,781. This application June 2, 1975, Ser. No. 583,129

Int. Cl.[2] B32B *31/20*

U.S. Cl. 156—179 **3 Claims**

1. A process for manufacturing a composite monolayer tape material of high strength, high modulus filaments in a metal matrix for use in the fabrication of a multilayer tape, composite article comprising the steps of:

positioning a plurality of high strength, high modulus reinforcing filaments parallel to each other and substantially uniformly spaced apart on a layer of metal foil, said filaments being aligned along the tensile axis of the tape material;

depositing a plasma spray layer of metal matrix material over said filaments to bond the filaments to the metal foil layer and to each other;

positioning an additional metal foil layer over the filaments and plasma sprayed matrix material;

consolidating the combination of foil layers, filaments, and plasma sprayed matrix material by the application of heat and pressure thereto until the matrix material is fully densified thus forming a consolidated, monolayer tape;

cleaning at least one side of said consolidated tape; and

applying a layer of adhesive polymer immediately after said step of cleaning to a cleaned side of said tape, the adhesive polymer being selected from the group consisting of a liquid resin, an unsupported layer of thermoplastic resin, a thermoplastic resin supported in a medium of fibrous material, and thermosetting resin supported in a medium of fibrous material.

3,979,245

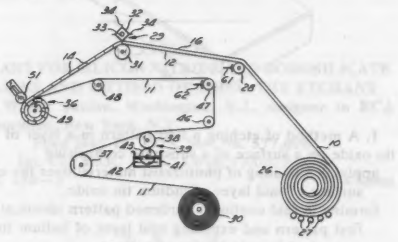
INSULATION BLANKET AND METHOD AND APPARATUS FOR MAKING SAME

John Bondra, Jr., Macedonia, and William R. Ruhling, Northfield, both of Ohio, assignors to Metal Buildings Insulation, Inc., Brooklyn Heights, Ohio

Division of Ser. No. 421,345, Dec. 3, 1973. This application Mar. 7, 1975, Ser. No. 556,283

Int. Cl.[2] B65H *81/00*

U.S. Cl. 156—184 **15 Claims**



1. A method of laminating a blanket having a facing on one side of an elongated insulation body formed of a loose fiber mat which is bendable and provides spring-back tending to cause it to assume a normal flat and uncompressed position in which the facing is substantially smooth comprising forming a plurality of lateral cuts in said body extending toward said one side from the opposite side thereof, engaging said facing with said one side with an intermediate layer of unset adhesive, rolling said facing and body with said facing inside and allowing said adhesive to set while in such rolled condition.

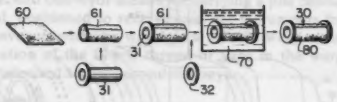
7. A machine for laminating an insulating body in accordance with claim 6 wherein said cutter is journalled on said machine for rotation about an axis extending laterally with respect to said body, and reaction means operate to hold said body against said cutter as said body moves through said cutter.

3,979,246

HEAT-INSULATED EXHAUST PIPE

Koichi Ikeda, and Hideo Ikeda, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 4, 1974, Ser. No. 447,741
Claims priority, application Japan, Mar. 5, 1973, 48-25918
Int. Cl.² B65H *81/00*
U.S. Cl. 156—187 1 Claim



1. A method of making a heat-insulated pipe for use in an exhaust line of an automobile internal combustion engine, comprising the steps of:

covering the outer surface of a stainless steel tube with an asbestos sheet;

immersing the covered tube in a processing liquid, said processing liquid being a colloidal dispersion in water of a mixture comprising about 45 parts by weight of amorphous silica gel, about 25 parts by weight of alumina and about 10 parts by weight of an organic polymer; and

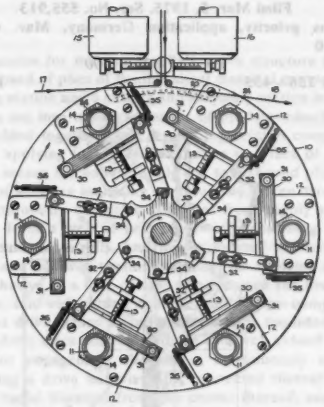
drying the covered tube after removal from said processing liquid at a temperature of about 120°C thereby to make the asbestos sheet stiffen and cling to the outer surface of the tube.

3,979,247

METHOD AND APPARATUS FOR DECORATING ARTICLES

Thomas L. Berg, 1110 23rd St., N. Bergen, N.J. 07047

Filed Jan. 15, 1975, Ser. No. 541,112
Int. Cl.² B44C *1/24*; B32B *1/02*, *31/20*; B41F *17/14*
U.S. Cl. 156—297 6 Claims



1. An apparatus for decorating the outer surface of articles at a plurality of decorating stations which comprises:

a. a first decorating station;

b. a second decorating station spaced from said first decorating station;

c. a rotary table adapted to advance the articles being decorated to said first and second decorating stations;

d. a plurality of mandrels rotatably mounted on said rotary table for supporting simultaneously articles to be decorated;

e. holding means engagable with each of said mandrels to restrict the movement of each of said mandrels during advancement of said rotary table so as to maintain orientation of the articles to be decorated with respect to one another;

f. registration means disposed between said first and second decorating stations for controlling the movement of each of said mandrels as it moves from said first decorating station to said second decorating station and changing the orientation of said article moving between said first and second decorating stations from that of the remaining articles mounted on said rotary table;

g. coupling means connected to said mandrel engagable with said registration means when the article is being moved from said first decorating station to said second decorating station, the relationship between said registration means and said coupling means being such that said mandrel is thereby positioned at said first and second decorating stations in accordance with a predetermined relationship; and

h. means for releasing said holding means when said article is being decorated.

6. A method of decorating the outer surface of articles at a plurality of decorating stations including at least a first and second decorating station which comprises:

a. mounting the articles on mandrel type holding means provided on a rotary table;

b. advancing the rotary table and articles mounted thereon to the first of said plurality of decorating stations;

c. restricting the movement of said article during said step of advancing so as to maintain the orientation of the mounted undecorated articles with respect to one another;

d. releasing the article from its movement restriction while at said first decorating station so as to allow the desired decoration to be applied thereto;

e. decorating the article at said first decorating station;

f. engaging the article holding means with a registration means subsequent to said article being decorated at said first decorating station to control the movement thereof and causing said article to be rotated 360° plus the angular distance between said first and second decorating stations while advancing the rotary table and article mounted thereon from said first decorating station to said second decorating station so that the article is thereby positioned with the same orientation at said first and second decorating stations;

g. releasing the article while at said second decorating station so as to allow the desired decoration to be applied thereto; and

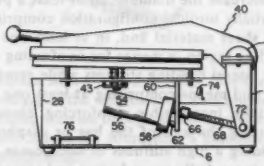
h. decorating the article at said second decorating station.

3,979,248

DECAL TRANSFER PRESS

Ernest A. Kussmaul, Sayville, N.Y., assignor to Images De Luxe, Inc., New York, N.Y.

Filed Sept. 12, 1975, Ser. No. 612,983
Int. Cl.² B32B *3/00*; G05G *15/00*
U.S. Cl. 156—358 17 Claims



1. A decal transfer press in which a surface heater mounted on an upper platen is brought into surface-to-surface contact

with a lower platen by moving the upper platen downwardly about the horizontal axis of a rock shaft to which the rear end of the upper platen is rigidly connected, wherein:

a. the lower platen is resiliently mounted at a central point thereof to the top of a box-like base,

b. the rock shaft is journaled above the lower platen at the top of said base,

c. a reversible motor within said base is coupled in driving relation to said rock shaft for moving said upper platen about said rock shaft axis,

d. means are provided for selectively energizing said motor to move said upper platen toward and away from said lower platen, and

e. means are provided, responsive to the force applied to said lower platen by said upper platen when said surface heater is brought into said surface-to-surface contact with said lower platen, for deenergizing said motor.

3,979,249

TIRE BUILDING APPARATUS

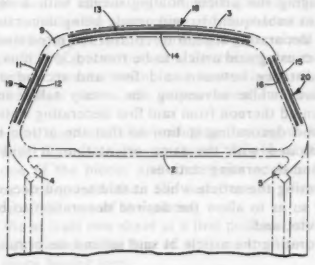
Ernest George Nicholls, Balsall Common, near Coventry, and Bernard Charles Allitt, Sutton Coldfield, both of England, assignors to Dunlop Limited, London, England

Continuation-in-part of Ser. No. 259,151, June 2, 1972, abandoned. This application Aug. 20, 1974, Ser. No. 498,935

Claims priority, application United Kingdom, June 10, 1971, 19818/71

Int. Cl.[2] B29H *17/16*

U.S. Cl. 156—416 **12 Claims**



1. An inflatable shaping bag or diaphragm for a tire building or shaping former which is expansible in a radial direction to effectively increase the diameter of at least a portion thereof to a substantially toroidal configuration comprising a flexible elastomeric sheet material and, in at least one circumferentially extending region, a means for reinforcing said region to have a high lateral bending stiffness while remaining radially expansible, said means comprising at least one pair of layers of substantially inextensible reinforcing elements lying in planes including the axis of the bag or diaphragm said elements providing a high stiffness in said planes, the layers of each pair being radially spaced apart and separated from one another by a layer of elastomeric material thereby creating a beam-like structure having a high lateral bending stiffness resulting in the outside shape of the bag or diaphragm in said planes being substantially flat in said reinforced regions.

3,979,250

APPARATUS FOR MAKING CONTINUOUS LENGTHS OF RESIN TUBES

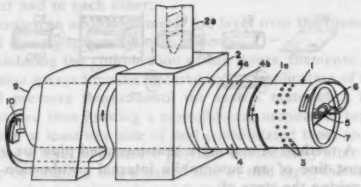
Frede Hilmar Drostholm, 2950 Vedbaek, Denmark

Filed Aug. 16, 1971, Ser. No. 171,921

Claims priority, application Denmark, Aug. 21, 1970, 4315/70

Int. Cl.[2] B32B *31/30*; B65H *81/08*

U.S. C[1]. 156—425 **5 Claims**



1. In apparatus for making tubes of resin material, which apparatus is of the kind having a supporting structure on which a carrier strip is mounted and fed through a plurality of adjacent turns of a helical path providing a moving surface for carrying the resin material, characterized in that the carrier strip has a projecting flange at one edge thereof offset inwardly from the strip so that the opposite edge of the helical turns of the strip overlap the flange of the adjacent helical turn, and further characterized by a supporting structure having a substantially cylindrical strip supporting surface, and friction reducing means associated with the interface between said substantially cylindrical supporting surface and the inner surface of the helical turns of the carrier strip.

3,979,251

APPARATUS FOR PRODUCING A PILE CARPET

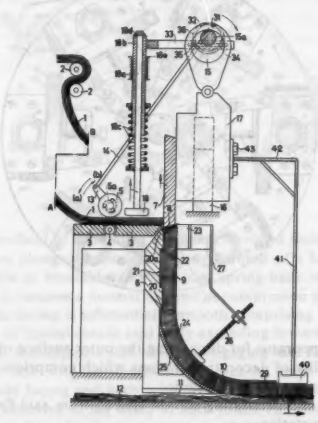
Rudolf Thiel, Hameln, and Kurt Witt, Coppenbrugge, both of Germany, assignors to Firma Otto Golze & Sohne, Kokosweberei, Hameln, Germany

Filed Mar. 5, 1975, Ser. No. 555,913

Claims priority, application Germany, Mar. 6, 1974, 2410710

Int. Cl.[2] B32B *5/00*

U.S. Cl. 156—435 **15 Claims**



1. Apparatus for producing pile fabric with step-wise feeding and withdrawing of the free end of a warp composed of fibers, thread or yarn, said apparatus comprising: feed means positioned to feed said warp; cutting apparatus positioned to

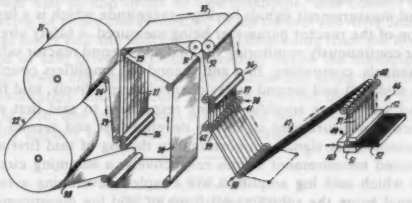
receive said warp from said feed means, including a moveable cutting member and means for advancing said cutting member for cutting increments of length of said warp and for retracting said cutting member for advancement of additional increments of said warp into cutting position; means for pushing cut increments of warp into a first conveyor means for transporting the cut increments to a second conveyor; means for causing withdrawal of the free end of the warp from contact with said cutting member before retraction of said cutting member; and a second conveyor means for carrying a pile fabric carrier material, positioned to receive said cut increments from said first conveyor; whereby withdrawal of said warp reduces disorganization of the fibers, thread or yarn in the warp increments delivered to the second conveyor.

3,979,252

APPARATUS FOR MANUFACTURING CELLULAR STRUCTURES

Edwin R. Hoyt, Everett, Wash., assignor to The Hoyt Corporation, Everett, Wash.

Filed Dec. 21, 1973, Ser. No. 427,381
Int. Cl.² B31D *3/02*; B32B *31/18*
U.S. Cl. 156—512 **7 Claims**



6. Apparatus for making a cellular core structure from a web composed of plies of flexible sheet material comprising a laminating section and a cutting and assembly section in which the web is cut into transverse strips of predetermined width and assembled together; said laminating section comprising means for applying first lines of adhesive to a face of one of said plies, means for adhering said ply to a second ply along said lines of adhesive including continuously driven drive rolls which continuously withdraw said plies from supply sources thereof to form a web of said plies, web tensioning means following said drive rolls, and means located between said drive rolls and said web tensioning means for applying second lines of adhesive to a face of said web between the first lines of adhesive; said web cutting and assembly section comprising intermittent drive means including a rotatably mounted drive roller and drive discs adapted to have said web extend therebetween for engagement thereby, a continuously rotated wheel having a drive bar pivotally connected thereto at an adjustable radial distance from the center thereof, and connecting means engaging said drive bar and connected through a one-way clutch to said drive roller whereby said drive roller is periodically rotated through a controllable angle to periodically advance said web a controllable distance, and cutting means following said intermittent drive means and periodically operable to shear transverse strips of predetermined width from the end of the web; and means for continuously maintaining the section of the web between said web tensioning means and said intermittent drive means in the form of a preformed loop having a length in excess of the distance between said intermittent drive means and said web tensioning means.

3,979,253

METHOD FOR DISPERSING GLASS FIBERS FOR THE PREPARATION OF GLASS FILTER MEDIA

Robert C. Clark, Annandale, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 462,841, April 22, 1974, abandoned. This application Feb. 5, 1976, Ser. No. 655,359
Int. Cl.² D21H *5/18*
U.S. Cl. 162—145 **7 Claims**

1. A method of making Beta fiber reinforced glass filter media which comprises:

heat cleaning a batch of Beta Glass fibers to remove any starch type sizing from the surface thereof;

mixing a small amount of a hydrophobic fumed silicon dioxide treated with a silane with a solution of hydrochloric acid;

adding said surface cleaned Beta Glass fibers to said hydrochloric acid solution containing said hydrophobic fumed silicon dioxide treated with a silane thereby forming a slurry and conditioning said fibers so that they will be held apart thus preventing roping or tangling of said fibers;

subjecting said slurry to a sonic probe for a period of about 6 minutes to disperse any clumps of Beta fibers into individual strands and to open the fibers to that they will become coated with said hydrophobic fumed silicon dioxide treated with a silane;

adding other glass fibers to said slurry;

mixing said added glass fibers with said Beta Glass fibers in said slurry;

pouring said slurry mix into a hand sheet mold;

permitting said solution to drain from said mold leaving behind said glass fiber mixture which forms a glass fiber filter, and then

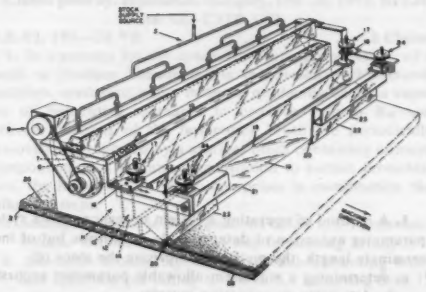
removing said filter from said mold.

3,979,254

SECONDARY HEADBOX FOR OVERLAY APPLICATION IN BOARD FORMATION

Howard L. McIntyre, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Apr. 6, 1973, Ser. No. 348,752
Int. Cl.² D21F *1/00*
U.S. Cl. 162—299 **3 Claims**



1. In combination with a board forming fourdrinier having a base sheet forming on the wire thereof, a secondary headbox capable of handling slurries of high solids consistencies positioned above and across the fourdrinier's machine direction, said headbox comprising:

a. a slurry feed header;

b. a first chamber into which the slurry from said header is introduced, said chamber including an underflow baffle beneath which the slurry initially passes and a driven perforated roll into and through which the slurry flows

whereby the slurry is mixed and evenly distributed across the width of said chamber;

c. a first weir over which the slurry from the first chamber passes into a second chamber;

d. a second chamber having a baffle positioned therein under which the slurry flows, the lower edge configuration of said baffle conforming to the hydraulic flow of the slurry whereby any slurry turbulence is dampened, said baffle being positioned from the wall of said second chamber whereby the flow of the slurry through the chamber is controlled;

e. a second weir over which the slurry flows out of the second chamber onto a declined apron; and

f. a baffle positioned from and forming a nip opening with the leading edge of said declined apron whereby slurry flow direction onto the base sheet is controlled, the lower edge of said baffle terminating in a straight edge parallel to the leading edge of the declined apron and positioned from 0 inches to about 3 inches below said leading edge whereby slurry flow is directed vertically downward onto the base sheet carried by the fourdrinier wire passing thereunder.

3,979,255

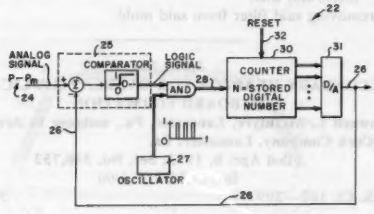
METHOD FOR OPERATING A SYSTEM WITH A VARIABLE EXCURSION MARGIN SETPOINT

Lawrence Ware Bulgier, West Suffield, and Charles Ronald Musick, Vernon, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Sept. 4, 1973, Ser. No. 394,030

Int. Cl.² G21C 7/00

U.S. Cl. 176—20 R **9 Claims**



1. A method of operating a system in response to a system parameter excursion of determinable magnitude but of indeterminate length, the method comprising the steps of:

a. determining a maximum allowable parameter excursion to determine an excursion margin;

b. monitoring said parameter;

c. generating a variable excursion setpoint by tracking and holding the minimum value of the sum of said monitored parameter and said excursion margin;

d. resetting said excursion setpoint to a value larger than said minimum value of the sum of said excursion margin and said monitored parameter only on permission from an independent decision maker;

e. comparing said monitored parameter to said setpoint; and

f. instituting responsive action when said monitored parameter exceeds said setpoint.

3,979,256

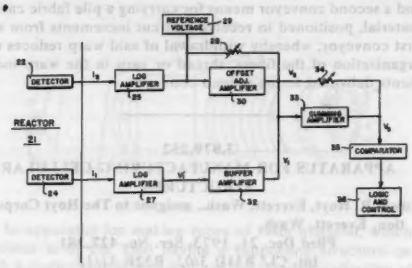
MONITORING CIRCUIT FOR REACTOR SAFETY SYSTEMS

Donald J. Keefe, Lemont, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 4, 1975, Ser. No. 555,330

Int. Cl.² G21C 7/00

U.S. Cl. 176—22 **3 Claims**



1. In a nuclear reactor which includes first and second reactor safety channels coupled to the reactor, each of the first and second reactor safety channels being responsive to the same reactor parameter to develop first and second measurement signals respectively, with each of the first and second measurement signals having a magnitude which is a function of the reactor parameter being measured, a safety circuit for continuously monitoring the first and second reactor safety channels, comprising: first and second log amplifiers coupled to said first and second safety channels respectively, said first and second log amplifiers being responsive to said first and second measurement signals to develop first and second log measurement signals proportional to the log of said first and second measurement signals respectively, a summing circuit to which said log amplifiers are coupled developing a ratio signal being the subtraction of one of said log measurement signals from the other of said log measurement signals, an offset voltage circuit coupled to one of said first and second log amplifiers for applying a reference dc voltage thereto so that with the absolute values of said log measurements equal said ratio signal has a desired nonzero value, and a comparator circuit coupled to said summing circuit and responsive to said ratio signal to develop an alarm signal with the magnitude of said ratio signal being outside of a predetermined range of magnitudes.

3,979,257

BOILING-WATER REACTOR

Diethelm Knödler, Erlangen, and Leonhard Irion, Ruckersdorf, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 28, 1974, Ser. No. 446,957

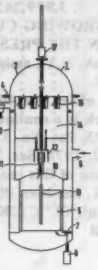
Claims priority, application Germany, Feb. 28, 1973, 2310080

Int. Cl.² G21C 7/12, 15/16

U.S. Cl. 176—54 **4 Claims**

1. A boiling-water reactor comprising a reactor pressure vessel having an inside and an outside and upper and lower ends, a reactor core in the inside of said vessel and positioned adjacent to said lower end, a steam dome in the inside of said vessel above said core, said vessel and steam dome forming a steam space above the steam dome inside of the vessel, said vessel having means for feeding feed water to below said steam dome and means for discharging steam from said space, at least one water separator positioned inside said vessel above said steam dome, at least one control rod drive on the outside of said vessel, a control rod drive shaft extending from said drive through said vessel into the vessel's inside, and at least one control rod insertable in said core and connected to said

drive shaft, at least one standpipe extending upwardly from said steam dome into said space and having a lower end fixed to the steam dome and opening from said core, said standpipe conducting steam from below said steam dome to said steam space and having an upper portion connected with and supporting said water separator and the standpipe having an upper end opening into the water separator, said standpipe having an inside, said control rod drive being positioned above the pressure vessel's said upper end and said control rod drive



shaft extending downwardly from said drive through the vessel's said upper end and said water separator and having a lower end in said inside of said standpipe, said control rod having an upper end connected to the control rod drive shaft's said lower end and said control rod depending from the lower end of said drive shaft and extending below the standpipe's said lower end below said steam dome and being insertable downwardly into said core and withdrawable upwardly from said core, and guide means for guiding said control rod vertically slidably in said inside of said standpipe.

3,979,258

NUCLEAR REACTOR

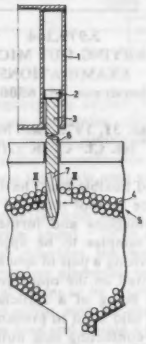
Fritz Schweiger, Hagen, and Erwin Glahe, Uentrop, Unna, both of Germany, assignors to Hochtemperatur-Kernkraftwerke GmbH (HKG) Gemeinsames Europaisches Unternehmen, Uentrop, Germany

Continuation of Ser. No. 234,632, March 14, 1972, abandoned. This application Apr. 1, 1974, Ser. No. 456,850

Claims priority, application Germany, Mar. 16, 1971, 2112472; Nov. 24, 1971, 2158178

Int. Cl.[2] G21C 7/10

U.S. Cl. 176—86 R **5 Claims**



1. In a nuclear reactor having a bed of spherical reaction elements forming a core, at least one axially elongated absorber control rod, and means connected to said control rod for inserting and withdrawing said rod in the axial direction into and out of the core, wherein the improvement comprises that said control rod as it is inserted into the core by said means contacts the reaction elements directly, said means is connected to said rod for moving said control rod only in the rectilinear direction into and out of the core in the axial direction of said control rod and wherein the connection of said rod to said means permits rotation of the rod about its longitudinal axis in response to the direct contact of the control rod with the spherical elements independent of the rectilinear movement provided by said drive means, said control rod having an external surface which contacts the reaction elements and said external surface has an axial length with the actual axial length of said external surface in contact with said reaction elements being variable based on the extent to which said control rod is inserted into said core, said axial length consists of a lead-in portion which extends for a substantial portion of said total axial length of said control rod which can contact the reaction elements from the end thereof which first enters the core as the control rod is inserted into the core and a remaining portion which extends axially from the trailing end of said lead-in portion and follows said lead-in portion as it is inserted into the core, the circumferentially extending said external surface of said lead-in portion has a varying radial dimension from the longitudianl axis of said control rod so that the reaction elements are deflected outwardly away from said control rod as it is displaced axially within said core, said remaining portion of said control rod has an axially extending thread means, and said thread means on said remaining portion comprises a screw thread formed continuously about the circumferential periphery of the external surface of said remaining portion so that the moving contact between said screw thread and the reaction elements caused by the movement of said control rod by said means effects the rotation of said control rod.

3,979,259

PROCESS FOR THE PRODUCTION OF FERMENTATION BROTH WITH INCREASED VITAMIN B_{12} CONTENT BY SYNCHRONIZING THE BACTERIUM POPULATION

Bela Johan; Laszlo Szemler; Tamas Szontagh; Laszlo Kutl; Emilia Simonovits; Judit Bekes nee Erdos; Denes Szekely; Janos Kiss; Erzsebet Kovacs nee Komoroczy, and Aniko Hargitai nee Franyo, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Oct. 24, 1974, Ser. No. 517,788

Claims priority, application Hungary, Oct. 26, 1973, RI 524

Int. Cl.[2] C12D 5/06

U.S. Cl. 195—28 VB **2 Claims**

1. In a process for the anaerobic septic fermentation of a broth to produce vitamin B_{12} in the presence of bacterial nutrients, methanol, and a methane producing bacteria capable of fermenting methanol to produce vitamin B_{12} and wherein portions of the fermenting broth are periodically removed and replaced by a nutrient broth containing nutrient components in a normal concentration to sustain fermentation, the improvement which comprises in combination the following steps:

a. adding methanol in daily amounts of 0.4 to 0.7 volumes/-volume % for 2 to 4 days to said fermenting broth;

b. thereafter monitoring the pH of said fermenting broth and upon the pH falling to 5.6 to 5.8 removing 5 to 15 volume percent of the fermenting broth and replacing same with an equal volume of a concentrated bacterial nutrient broth which contains the nutrient components in 5 to 12 times higher concentration than said normal concentrations, and repeating this step once during each interval of 5 to 12 days;

c. between repetitions of step (b) and each day for periods of 5 to 10 days removing 5 to 15 volume percent of the fermenting broth daily and replacing same with an equal volume of the bacterial nutrient broth with said nutrient compositions in said normal concentrations together with 0.4 to 1.5 volume percent of methanol; and

d. interrupting the removal of fermenting broth in step (c) for a period up to two days and adding only 0.4 to 1.5 volume percent of methanol to the ferming broth during the interruption.

3,979,260

PRODUCTION OF DEACETOXYCEPHALOSPORIN C

Yoshio Nakao; Kazuaki Kitano; Kazuhiko Kintaka; Shigeru Suzuki; Kazuyoshi Katamoto, all of Osaka, and Kiyoshi Nara, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed June 14, 1974, Ser. No. 479,575

Claims priority, application Japan, June 16, 1973, 48-68106; Oct. 8, 1973, 48-113000; Jan. 16, 1974, 49-8098

Int. Cl.² C12D 9/04

U.S. Cl. 195—36 C 29 Claims

1. A method for producing deacetoxycephalosporin C which comprises cultivating *Streptomyces griseus*, *Streptomyces hygroscopicus*, *Cephalosporium acremonium* K-186 (ATCC-20416) *Emericellopsis microspora* K-163 (ATCC-20422), *Paecilomyces carneus* C-2237 (ATCC-20417), *Paecilomyces carneus* C-4053 (IFO-9730), *Paecilomyces persicinus* C-3009 (ATCC-20418), a microorganism of the genus Anixiopsis, a microorganism of the genus Arachnomyces or a microorganism of the genus Spiroidium, which is capable of producing deacetoxycephalosporin C, in a culture medium containing an assimilable carbon source and a digestible nitrogen source until deacetoxycephalosporin C is accumulated in a substantial amount in the cultured broth, and recovering the accumulated deacetoxycephalosporin C from the broth.

3,979,261

PRODUCTION OF GLUCOSE ISOMERASE BY BACILLUS COAGULANS

Helle Outtrup, Vaerloese, Denmark, assignor to Novo Industri A/S, Bagsvaerd, Denmark

Filed Dec. 27, 1973, Ser. No. 428,682

Claims priority, application United Kingdom, Jan. 12, 1973, 1773/73

Int. Cl.² C12D 13/10

U.S. Cl. 195—65 2 Claims

1. A process for the production of glucose isomerase, comprising cultivating under aerobic conditions an atypical *Bacillus coagulans* productive of a glucose isomerase, said *Bacillus coagulans* being capable of growth on only inorganic nitrogen sources as the nitrogen source and at a temperature of 65°C on a nutrient medium containing a nitrogen source, a carbon source, optionally including xylose, small amounts of inorganic salts, at a pH value between 5 and 9 and a temperature between 40° and 65°C, whereafter the glucose isomerase thus produced is recovered.

3,979,262

COMPOSITIONS AND METHODS FOR THE DETERMINATION OF OXIDIZING AGENTS

Paul Hunziker, Basel, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Feb. 11, 1975, Ser. No. 548,939

Claims priority, application Switzerland, Feb. 12, 1974, 2150/74

Int. Cl.² C12K 1/04, 1/10

U.S. Cl. 195—103.5 R 22 Claims

1. A composition for the colorimetric determination of oxidizing agents comprising:

a. as the first component, an amine selected from the group consisting of an aromatic amine and an acid addition salt thereof with the proviso that substituents on the aromatic amine are not simultaneously in the ortho and para positions;

b. as the second component, a compound, capable of oxidatively coupling with the amine of the first component to form a colored entity, selected from the group consisting of a hydrazone and an acid addition salt thereof; and

c. as the third component, a buffer selected from the group consisting of citric acid, maleic acid and mixtures of citric and maleic acid wherein the amount of the buffer component in the composition is such as to provide for a preselected pH range of from about 3.2 to about 5.5 in a resulting colored medium.

3,979,263

METHOD FOR GROWING CULTURES IN A BODY CAVITY IN THE PRESENCE OF GAS

Louis Bucalo, Holbrook, N.Y., assignor to Microbyx Corporation, Holbrook, N.Y.

Continuation-in-part of Ser. No. 405,939, Oct. 12, 1973, Pat. No. 3,864,213, which is a continuation-in-part of Ser. No. 329,862, Feb. 5, 1973, Pat. No. 3,842,166. This application June 12, 1974, Ser. No. 478,706

The portion of the term of this patent subsequent to Oct. 15, 1991, has been disclaimed.

Int. Cl.² C12K 1/04

U.S. Cl. 195—103.5 R 16 Claims

1. In a culturing method, the steps of supporting a nutrient for a microorganism on a carrier for the nutrient, situating the carrier with the nutrient thereon in a body cavity which has a given atmosphere while contacting the nutrient with a body fluid which may have therein a microorganism which will grow in the nutrient, modifying said atmosphere for said microorganism to facilitate the growth of said microorganism, maintaining the nutrient while it is in the body cavity exposed to said modified atmosphere so that a microorganism will grow in the nutrient, and, after a given time sufficient for growth of the microorganism in the nutrient adequate to render the microorganism visible, removing the carrier with the nutrient thereon from the body cavity and then checking for the presence of the microorganism.

3,979,264

BAND FOR CARRYING OUT MICROBIOLOGICAL EXAMINATIONS

Heinz Buerger, Kaiserstrasse 25, 6500 Mainz, Rhineland 1, Germany

Filed Mar. 31, 1975, Ser. No. 563,839

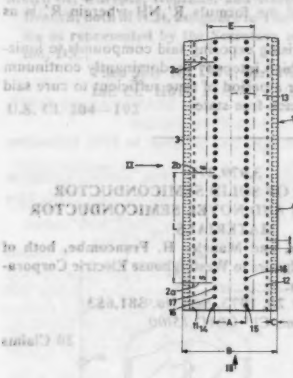
Int. Cl.² C12K 1/10

U.S. Cl. 195—139 18 Claims

1. In an elongated flexible band having a nutrient medium on a nutrient surface thereof intended for inoculation in microbiological examinations and further having a sufficient length for several samples to be applied in sequence, the improvement comprising a pair of spaced rows of longitudinal spacer means mounted on the opposite surface of said band, said spacer means being of a sufficient height above said opposite surface of said band to prevent the opposite surface of said band from contacting said nutrient surface and said nutrient medium thereon when said band is rolled or folded to effect an engagement of said nutrient surface with said spacer means, said spacer means defining passageway means extending laterally of said band to facilitate the lateral movement of a gas across said nutrient medium when said band is in a rolled

or folded condition wherein the nutrient surface is engaging said spacer means.

18. A method for coating and inoculating a band comprising the steps of continuously applying said nutrient medium to

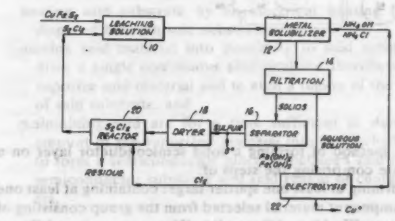


said band in liquid condition and wherein after the inoculation of a certain band section with a sample to be examined, a trace of p-nitrophenylglycerin is laid on said band to prevent bacteria from migrating from the section.

3,979,265
RECOVERY OF METALS FROM SULFUR BEARING ORES

Anthony G. Fonseca, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Dec. 19, 1974, Ser. No. 534,324
Int. Cl.² C25C *1/12, 1/08, 1/16, 1/20*
U.S. Cl. 204—105 R **13 Claims**



1. A process for recovering certain metals which form water-soluble ammonium-containing compounds, from raw materials comprising an ore containing said certain metals in a form leachable with sulfur monochloride and also containing iron and sulfur in a form leachable with sulfur monochloride, comprising:

leaching the raw material with sulfur monochloride at a temperature of from about −30°to about 160°C to remove therefrom as chlorides, the metal to be recovered and iron, and to remove elemental sulfur therefrom;

solubilizing the metal values to be recovered by contacting said chlorides and sulfur with an aqueous solution containing ammonium ions and having a pH of at least about 3 whereby said iron chlorides are converted to iron hydroxides and precipitated; then

recovering the metal values from the aqueous solution by an electrowinning process or by precipitating the metal values as metal oxide.

3,979,266
PROCESS FOR PURIFYING AQUEOUS SOLUTIONS, OF METAL IONS PRECIPITATING AS ARSENIDES, ANTIMONIDES, TELLURIDES, AND SELENIDES

Sigmund Peder Fugleberg, Kokkola, and Jussi Kalevi Rastas, Pori, both of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Sept. 8, 1975, Ser. No. 611,002
Claims priority, application Finland, Sept. 20, 1974, 2754/74
Int. Cl.² C25C *1/16*
U.S. Cl. 204—119 **11 Claims**

1. A process for purifying aqueous solutions of cobalt, nickel and copper ions precipitating as arsenides, comprising:

adding to the aqueous solution as an auxiliary agent at least one of arsenic and arsenic (III) compounds;

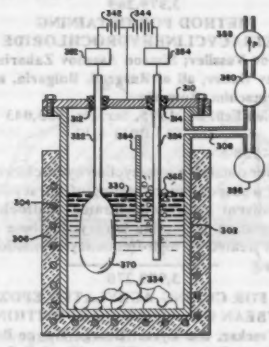
maintaining reducing conditions to cement the impurities from the aqueous solution by means of said auxiliary agent; and

contacting the aqueous solution with a quantity of the cementate substantially greater than that primarily cemented from the aqueous solution in order to catalyze the cementation.

3,979,267
ELECTROLYTIC METHOD

Douglas W. Townsend, 35 Front St. S. Apt. 410, Port Credit Ontario, L5H 2C6, Canada

Continuation-in-part of Ser. No. 220,245, Jan. 24, 1972, abandoned. This application May 15, 1973, Ser. No. 360,467
Int. Cl.² C25D *21/04, 3/54;* C25C *3/18, 3/26*
U.S. Cl. 204—130 **11 Claims**



1. For removing substantially all oxygen from a electrolytic melt consisting essentially of at least one fluoride selected from the group of alkali metal fluorides and alkaline earth metal fluorides, the process comprising the steps of:

A. maintaining said melt above its melting temperature;

B. maintaining the ambient pressure on said melt at less than one-third atmosphere;

C. providing in said melt an anode comprised essentially of carbon, and

D. maintaining a positive potential of about 1 to 3 volts on said anode relative to said melt sufficient to remove oxygen but less than the potential at which anode effect occurs.

3,979,268
METHOD AND APPARATUS FOR REMOVING IMPURITIES FROM LIQUID METALS

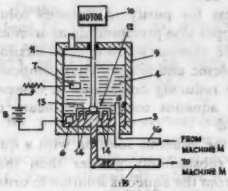
Anthony John Walkden, Carpenders Park, England, assignor to The General Electric Company Limited, London, England

Filed May 28, 1975, Ser. No. 581,487

Claims priority, application United Kingdom, June 6, 1974, 25147/74

Int. Cl.² C25C *3/00*

U.S. Cl. 204—140 **15 Claims**



1. A method of removing from a liquid metal an impurity produced during circulation of the liquid metal through an equipment, the method comprising: passing a flow of liquid metal from the equipment into a chamber containing a quantity of said liquid metal and a quantity of liquid electrolyte in which electrolyte the impurity dissociates to form positive and negative ions, said electrolyte floating on said liquid metal or vice versa depending on their relative densities; applying a voltage between a pair of electrodes disposed respectively in said electrolyte and said liquid metal in said chamber; and circulating a flow of said liquid metal from said chamber through said equipment and thence back to said chamber with an appreciable quantity of said electrolyte.

3,979,269
METHOD FOR OBTAINING TETRACYCLINEHYDROCHLORIDE

Hristo Dimitrov Vassilev; Simeon Assenov Zahariev, and Danail Yovchev Donev, all of Razgrad, Bulgaria, assignors to DSO "Pharmachim, Bulgaria

Filed Feb. 25, 1975, Ser. No. 553,043

Int. Cl.² B01J *1/12*

U.S. Cl. 204—158 S **4 Claims**

1. Method for obtaining tetracycline hydrochloride through interaction of a suspension consisting of tetracycline base in an organic solvent with concentrated hydrochloric acid, wherein the solution containing tetracycline base and hydrochloric acid is treated by high-frequency oscillations.

3,979,270
METHOD FOR CURING ACRYLATED EPOXIDIZED SOYBEAN OIL AMINE COMPOSITIONS

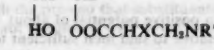
David John Trecker, Old Lyme; George Wayne Borden, East Lyme, both of Conn., and Oliver Wendell Smith, South Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 476,055, June 3, 1974, which is a division of Ser. No. 343,691, March 22, 1973, Pat. No. 3,876,518, which is a continuation-in-part of Ser. No. 103,912, Jan. 4, 1971, abandoned. This application Mar. 28, 1975, Ser. No. 563,131

Int. Cl.² C08F *8/00*

U.S. Cl. 204—159.14 **10 Claims**

1. A method for curing acrylated epoxidized soybean oil amine compounds having in the molecule the group:



wherein X is hydrogen or methyl, R′ taken singly is alkyl of 1 to 15 carbon atoms or phenyl, and the two R′ groups taken together with the nitrogen atom attached thereto form a heterocyclic ring having from 5 to 6 ring atoms, said compound being the reaction product of:

A. epoxidized soybean oil reacted with at least two moles of acrylic acid or methacrylic acid per mole thereof and

B. from 5 to 40 mole percent, based on acrylyl groups of an organic amine of the formula R'_2NH wherein R′ is as defined above,

said method comprising exposing said compounds to ionizing radiation or high intensity predominantly continuum light radiation for a period of time sufficient to cure said compound to a tack-free state.

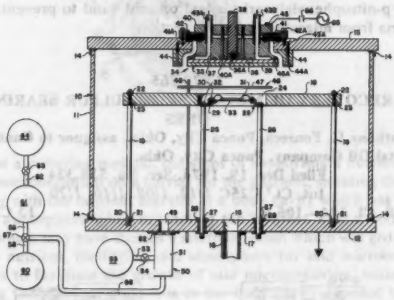
3,979,271
DEPOSITION OF SOLID SEMICONDUCTOR COMPOSITIONS AND NOVEL SEMICONDUCTOR MATERIALS

Alexander J. Noreika, and Maurice H. Francombe, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 23, 1973, Ser. No. 381,653

Int. Cl.² C01C *15/00*

U.S. Cl. 204—192 **20 Claims**



1. A method of forming a solid semiconductor layer on a substrate comprising the steps of:

A. forming at least one sputter target containing at least one component material selected from the group consisting of Group IIIa-Va and Group IVa-IVa compounds and Group IIIa, Group IVa, and Group Va elements for forming material to be deposited on the substrate;

B. disposing each formed sputter target and a substrate prepared for deposition thereon in a spaced relation in a partial vacuum chamber;

C. introducing into the vacuum chamber a gas mixture containing at least one reactive gas composition containing at least one element selected from the group consisting of Group IIIa, Group IVa and Group Va elements for forming material to be deposited such that the formed sputter target or targets introduced reactive gas composition or compositions are capable of forming all the materials to be deposited on the substrate;

D. sputtering the component material from at least one said sputter target to deposit material on the substrate; and

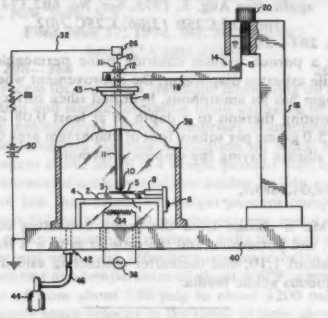
E. simultaneously with step D, electrically discharge reacting at least one said reactive gas composition to deposit material on the substrate, and forming on the substrate, with the material deposited by sputtering, said solid layer of semiconductor material.

3,979,272

METHOD OF PRODUCING SEMICONDUCTOR DEVICES WITH MINORITY CHARGE CARRIERS HAVING A LONG LIFETIME AND DEVICES PRODUCED THEREBY

Metro M. Chrepta, Neptune, and Harold Jacobs, West Long Branch, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 18, 1974, Ser. No. 489,872
Int. Cl.² H01L *21/203, 21/265, 21/38*
U.S. Cl. 204—192 **6 Claims**



1. A process for implanting a material for producing a region of charge carriers of one conductivity type into the surface of an intrinsic semiconductor substrate comprising the steps of:

establishing a potential difference between said material and said substrate,

heating said substrate by an electrical heating filament disposed beneath said substrate,

moving said material into proximity to said substrate to draw a single continuous electrical arc therebetween to vaporize said material and to etch a region of the surface of said substrate, and

maintaining said arc for a time sufficient to deposit an amount of the vaporized material into the etched region to form a semiconductor junction between said intrinsic semiconductor substrate and said region of charge carriers.

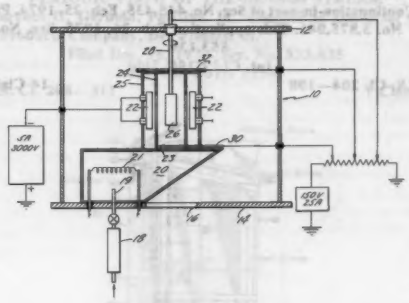
3,979,273

METHOD OF FORMING ALUMINIDE COATINGS ON NICKEL-, COBALT-, AND IRON-BASE ALLOYS

Carlino Panzera, Cromwell, Conn., and Richard Carroll Krutenat, Richland, Wash., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 27, 1975, Ser. No. 580,631
Int. Cl.² C23C *15/00, 13/02;* **B23P** *3/20*
U.S. Cl. 204—192 **5 Claims**

1. In a method of forming an oxidation- and sulfidation-resistant alloy coating on a nickel-base, cobalt-base or iron-base alloy gas turbine engine component wherein a platinum group metal is deposited on said alloy and then aluminized to diffuse both said aluminum and said platinum group metal into the surface thereof, the improvement which comprises, prior to aluminizing, depositing on said alloy a combination coating at least approximately one micron, but less than three microns thick, consisting essentially of 90–97%, by weight, platinum group metal selected from the group consisting of platinum, palladium, rhodium, ruthenium, osmium and iridium and



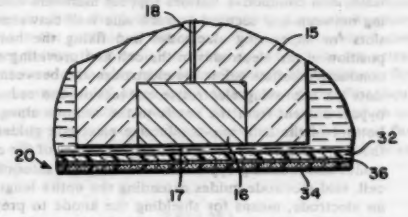
3–10%, by weight, of an active metal selected from the group consisting of yttrium, hafnium and zirconium.

3,979,274

MEMBRANE FOR ENZYME ELECTRODES

David P. Newman, Yellow Springs, Ohio, assignor to The Yellow Springs Instrument Company, Inc., Yellow Springs, Ohio

Filed Sept. 24, 1975, Ser. No. 616,326
Int. Cl.² G01N *27/46*
U.S. Cl. 204—195 B **9 Claims**



1. A polarographic cell structure for use in polarographic analysis of an unknown comprising an electrically insulating support means, and electrode means mounted in said support means, said electrode means including means defining an active exposed working face, wherein the improvement comprises:

a laminated membrane of a total thickness of less than 25 microns positioned between said working face and said unknown, said membrane consisting essentially of a first layer of an essentially homogeneous material selected from the group consisting of silicone rubber, methyl methacrylate, and cellulose acetate and having a thickness of less than 2 microns, a second layer of a support material which permits passage of low molecular weight substances but excludes high molecular weight substances, said support material having a thickness of between 1 and 20 microns, and an enzyme preparation positioned between and adhesively bonding said first and second layers.

3,979,275

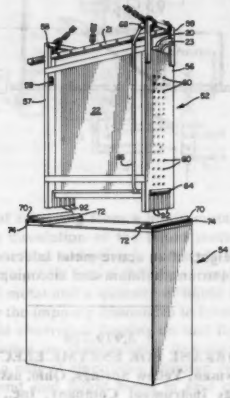
APPARATUS FOR SERIES ELECTROWINNING AND ELECTROREFINING OF METAL

Walter W. Harvey, Bedford; Myron R. Randlett, Burlington, and Karlis I. Bangerskis, Walpole, all of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 445,435, Feb. 25, 1974, Pat. No. 3,875,041. This application Feb. 26, 1975, Ser. No. 553,139

Int. Cl.[2] C25C 7/00

U.S. Cl. 204—198 14 Claims



1. A series electrodeposition cell comprising:

a. a tank for containing electrolyte;

b. a conveyable rack in the tank which can be loaded with electrodes at a location remote from the tank, said rack being formed of a non-conductive material and including a pair of side walls having slots on the bottom extending through the side walls to allow fluid flow through the side walls, non-conductive bottom support members extending between and secured to each side wall between the slots for supporting electrodes and fixing the bottom position of the electrodes in the cell and providing non-conductive baffles below the electrodes and between the slots for improving electrolyte convection and reducing bypass current from the anode to the cathode along the bottom of the cell, non-conductive electrode guides on the sides of the rack for positioning the sides of the electrodes and reducing bypass current along the sides of the cell, said electrode guides extending the entire length of an electrode, means for shielding the anode to prevent current from passing along the sides, bottom and back of the anode toward the cathode;

c. an anode positioned in the rack;

d. a cathode positioned in the rack;

e. a series of bipolar electrodes within the electrode guides and resting on the bottom support members and close spaced apart from each other between the anode and the cathode; and,

f. bubble tubes having orifices for generating sheets of relatively small, rapidly ascending bubbles of gas that result in agitation of the electrolyte over the cathode faces of the bipolar electrodes, the portion of the bubble tubes having orifices being positioned between and below the bipolar electrodes, said bubble tubes being positioned in the slots in said sides; said baffles and electrode guides forming compartments within the cell which minimize lateral spreading and contraction of the sheet of bubbles and reducing the possibility of bypass current by blocking the electrical path along the bottom and sides of the electrode, the slots on the bottom of the sidewalls of the rack enabling the electrolyte to circulate throughout the cell in a continuous manner when the upward convection created by the bubbles of gas pushes the electrolyte over the top edge of the rack and down the side of the tank to the bottom of the rack said compartments and bubble tubes producing electrolyte convection which enables the efficient use of high current densitites in an electrodeposition process.

3,979,276

SILICATE TREATED ASBESTOS DIAPHRAGMS FOR ELECTROLYTIC CELLS

Franklin Strain, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 468,844, May 10, 1974, which is a division of Ser. No. 343,600, March 21, 1973, Pat. No. 3,847,762. This application Aug. 5, 1975, Ser. No. 602,174

Int. Cl.[2] C25B 13/06; C25C 7/02

U.S. Cl. 204—282 8 Claims

1. In a porous sodium chloride brine permeable fibrous chrysotile asbestos diaphragm, the improvement wherein said diaphragm has an amorphous, hydrated silica surface formed by depositing thereon to a depth of at least 0.08 inch from 0.01 to 5.0 grams per square foot of diaphragm area of a water soluble silicate having the empirical formula:

$$(Me_2O)_m(SiO_2)_n$$

where Me is chosen from the group consisting of lithium, sodium, and potassium, and the ratio of m to n is from about 1:1 to about 1:10, and thereafter contacting said diaphragm with aqueous acidic media.

3,979,277

HYDROPROCESSING OF HYDROCARBONS

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 443,046, Feb. 15, 1974, Pat. No. 3,900,386, which is a continuation-in-part of Ser. No. 365,782, May 31, 1973, Pat. No. 3,839,193, which is a continuation-in-part of Ser. No. 27,457, April 10, 1970, abandoned. This application Feb. 21, 1975, Ser. No. 551,955

Int. Cl.[2] C10G 23/04

U.S. Cl. 208—143 4 Claims

1. A hydrocarbon hydroprocess for hydrogenating a coke-forming hydrocarbon distillate containing di-olefinic and mono-olefinic hydrocarbons and aromatics which process comprises reacting said distillate with hydrogen at a temperature below about 500°F. and at conditions selected to effect chemical consumption of hydrogen, in contact with a catalytic composite of a platinum or palladium component, an iridium component, a germanium component and a porous carrier material, substantially all of the platinum or palladium component and the iridium component being in the elemental metallic state and the germanium component being in an oxidation state above that of the elemental metal and recovering an aromatic/mono-olefinic hydrocarbon concentrate substantially free from conjugated di-olefinic hydrocarbons.

3,979,278

HYDROPROCESSING OF HYDROCARBONS

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 443,046, Feb. 15, 1974, Pat. No. 3,900,386, which is a continuation-in-part of Ser. No. 365,782, May 31, 1973, Pat. No. 3,839,193, which is a continuation-in-part of Ser. No. 27,457, April 10, 1970, abandoned. This application Feb. 21, 1975, Ser. No. 551,956

Int. Cl.[2] C10G 23/04

U.S. Cl. 208—143 5 Claims

1. A hydrocarbon hydroprocess for improving the jet fuel characteristics of a sulfurous kerosene boiling range fraction, which process comprises reacting said kerosene fraction with

hydrogen at conditions selected to effect chemical consumption of hydrogen in a catalytic reaction zone containing a catalytic composite of a platinum or a palladium component, an iridium component, a germanium component and a porous carrier material, substantially all of the platinum or palladium component and the iridium component being in the elemental metallic state and the germanium component being in an oxidation state above that of the elemental state, and separating the resulting reaction zone effluent to recover a normally liquid kerosene fraction having improved jet fuel characteristics.

3,979,279

TREATMENT OF LUBE STOCK FOR IMPROVEMENT OF OXIDATIVE STABILITY

Tsoung-Yuan Yan, Trenton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed June 17, 1974, Ser. No. 480,062

Int. Cl.² C10G *23/04*

U.S. Cl. 208—264 **20 Claims**

1. A process for forming a stabilized lubricating oil resistant to oxidation and sludge formation upon exposure to a highly oxidative environment which comprises contacting a high boiling hydrocarbon fraction lubrication oil stock having a sulfur content above about 0.4 weight percent with hydrogen in the presence of a catalyst of low acidity having a chlorine content of less than about 1.5 weight percent comprised of from about 0.1 to about 10 weight percent metal selected from the group consisting of platinum, palladium and a combination thereof on a solid refractory inorganic oxide support, said contacting at a temperature of about 400°F, a pressure in the range of from about 150 psig to about 1200 psig and a weight hourly space velocity in the range of from about 0.1 to about 10.

3,979,280

SEPARATION OF UNSATURATED COMPOUNDS FROM LIQUID HYDROCARBON MIXTURES CONTAINING SAME

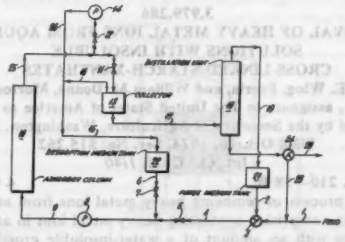
Maximilian Dielacher, Hamburg, and Uwe Hansen, Jesteburg, both of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed Dec. 12, 1974, Ser. No. 531,950

Claims priority, application Germany, Dec. 22, 1973, 2364306

Int. Cl.² C10G *25/02*

U.S. Cl. 208—310 R **11 Claims**



1. In a process for the separation of unsaturated compounds from liquid hydrocarbon mixtures containing same by contacting the mixture with a metal ion laden cation exchange resin having a specific surface area of at least 1 m^2/g and an average pore diameter of greater than 10 A, the improvement which comprises adsorbing said unsaturated compounds on a macroporous dehydrated cation exchange resin laden with monovalent silver or copper ions and subsequently displacing said unsaturated compounds in liquid phase from said resin at a temperature between about 10° and 40°C. and a pressure between about 1 and 30 atmospheres using a normally gaseous olefin as the desorption medium.

3,979,281

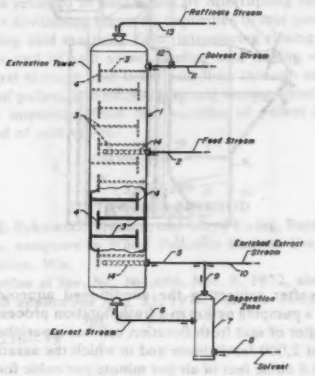
CONTINUOUS LIQUID EXTRACTION PROCESS WITH PERIODIC FLOW OF THE DENSER STREAM

Clarence G. Gerhold, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 16, 1974, Ser. No. 533,435

Int. Cl.² C01G *21/00*

U.S. Cl. 208—311 **7 Claims**



1. In a liquid-liquid extraction process wherein a high density first liquid is passed into a first portion of an extraction tower containing a plurality of perforated contacting trays, a second liquid having a lower density than the first liquid is continuously passed into a lower second portion of the extraction tower at a constant rate of flow, and the first liquid and the second liquid are contacted as the second liquid passes unidirectionally upward through a layer of the first liquid maintained on the perforated contacting trays, the improvement in the method of operation of the process which comprises passing the first liquid of higher density into the extraction tower in the form of a stream having a discontinuous flow rate comprised of preselected quantities of the first liquid corresponding to the amount of first liquid maintained on one of said perforated contacting trays, which discontinuous flow rate effects a pulsed flow of the first liquid downward between contiguous contacting trays.

3,979,282

FLOTATION OF FINE-GRAINED MATERIALS

Edwin K. Cundy, Cornwall, England, assignor to English Clays Lovering Pochin & Company Limited, Cornwall, England

Continuation of Ser. No. 263,611, June 16, 1972, abandoned, which is a continuation-in-part of Ser. No. 803,875, March 3, 1969, abandoned. This application Jan. 16, 1975, Ser. No. 541,398

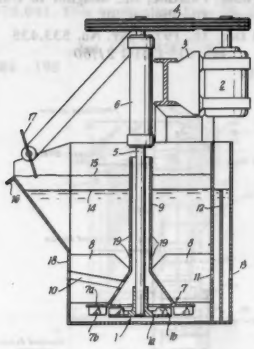
Claims priority, application United Kingdom, Mar. 11, 1968, 11856/68

Int. Cl.² B03D *1/00*

U.S. Cl. 209—166 **14 Claims**

1. A process for treating a fine mineral consisting substantially completely of particles smaller than 50 microns equivalent spherical diameter in order to separate therefrom mineral impurities, which process comprises the steps of (a) conditioning the fine mineral in the form of an aqueous slurry, having a solids content of at least 30 percent by weight and containing a deflocculant, for a time sufficient to dissipate therein at least 25 horsepower hours of energy per ton of mineral solids; (b) mixing with the aqueous mineral slurry

before or during the conditioning thereof a collector; (c) introducing the conditioned mineral slurry into a froth flotation cell having a central, internal, submerged impeller which comprises a base plate, to which there are attached a plurality of blades in radial arrangement, and a stationary cover plate separated from the tips of the blades by a small clearance; and



(d) thereafter subjecting the conditioned aqueous mineral slurry to a pumping action in a froth flotation process in which the impeller of said froth flotation cell has a peripheral speed of at least 2,000 feet/minute and in which the aeration rate is at least 0.8 cubic feet of air per minute per cubic foot of froth flotation cell volume.

3,979,283

MICROBIAL DEGRADATION OF DDT

Carolina M. Prudom, McLean, Va., assignor to Bioteknika International, Inc., Springfield, Va.

Filed Sept. 25, 1974, Ser. No. 509,115

Int. Cl.² C02C *5/10*

U.S. Cl. 210—11 **9 Claims**

1. A process for the microbial degradation of dichlorodiphenyl-trichloroethane (DDT) which comprises treating the DDT with Penicillium sp. ATCC *20369* for a sufficient time until the DDT has been substantially degraded.

3,979,284

ARTIFICIAL HAEMODIALYSIS KIDNEYS

Alain Granger, Lesigny, and Andre Sausse, Sceaux, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Continuation of Ser. No. 384,286, July 31, 1973, abandoned. This application Mar. 21, 1975, Ser. No. 560,861

Claims priority, application France, July 31, 1972, 72.27582

Int. Cl.² B01D *31/00, 13/00*

U.S. Cl. 210—22 A **3 Claims**

1. An artificial haemodialysis kidney comprising, in combination:

a. A source of dialysis liquid;

b. a haemodialyser including a membrane capable of permitting simultaneous dialysis and ultrafiltration of blood;

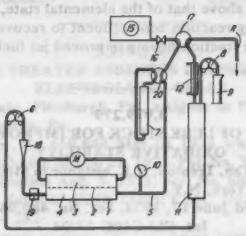
c. a chamber on one face of said membrane connectable to a blood stream;

d. a constant volume closed system in the form of a closed loop having a wall portion formed by a second face of said membrane, said system containing a dialysis liquid;

e. a circulation pump in said loop downstream of the dialyser;

f. means for withdrawing by pumping from said constant volume closed system, at a predetermined rate, a fraction of the dialysis liquid so that the volume of liquid in said system is maintained constant;

g. a two position valve system, movable between a first position in which simultaneously the source of liquid is connected to the constant volume closed system to direct said liquid to said membrane and the liquid having passed said membrane is directed in open circuit to the exterior,



and a second position which simultaneously isolates the constant volume closed system from the source and from the exterior to form a closed circuit for the dialysis liquid; and

h. means for adjusting the pressure difference on either side of the membrane.

3,979,285

PROCESS FOR THE PURIFICATION OF INDUSTRIAL EFFLUENTS

Hans Wegmüller, Riehen, and Jaroslav Haase, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 356,853, May 3, 1973, abandoned. This application May 29, 1975, Ser. No. 582,021

Claims priority, application Switzerland, May 10, 1972, 007012/72

Int. Cl.² C02B *1/60*; C02C *5/08*

U.S. Cl. 210—36 **6 Claims**

1. A process for purifying industrial effluents containing residual substances consisting of dyestuffs, optical brighteners, dyeing auxiliaries, detergents or tanning agents, which comprises bringing said effluents into contact with a cellulosic adsorbent which is pretreated with polyamidopolyamines produced by condensation from a polymeric fatty acid and a polyamine, to remove said substances.

3,979,286

REMOVAL OF HEAVY METAL IONS FROM AQUEOUS SOLUTIONS WITH INSOLUBLE CROSS-LINKED-STARCH-XANTHATES

Robert E. Wing, Peoria, and William M. Doane, Morton, both of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 16, 1974, Ser. No. 515,262

Int. Cl.² C02B *1/40*

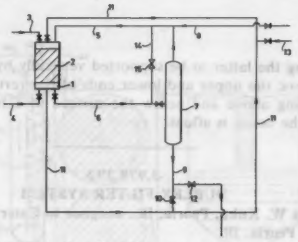
U.S. Cl. 210—38 B **4 Claims**

1. A process of removing heavy metal ions from aqueous solutions comprising contacting heavy metal ions in aqueous solutions with an amount of a water-insoluble crosslinked-starch-xanthate, wherein said crosslinked-starch-xanthate has been prepared by first crosslinking starch with a crosslinking reagent and subsequently xanthating the crosslinked starch by reacting the same with carbon disulfide, and wherein said crosslinked-starch-xanthate has a degree of crosslinking (DCL) such that said crosslinked-starch-xanthate exhibits a degree of swelling in water at 95° C. of from 65% to 450%, said amount of crosslinked-starch-xanthate being such that the molar ratio of the xanthate moiety to metal ions is about 1:1, and removing said heavy metal ions from said aqueous solution.

3,979,287
ADSORPTION PROCESS

Pierre Roland Edouard Vulliez-Sermet, London, and Elio Fiorentino, West Byfleet, both of England, assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed July 9, 1975, Ser. No. 594,258
Claims priority, application United Kingdom, July 12, 1974, 30951/74
Int. Cl.² B01D *15/06*
U.S. Cl. 210—40 8 Claims

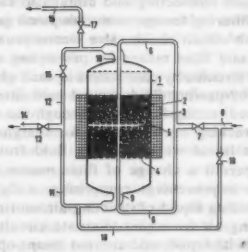


1. A process for separating in concentrated form a dissolved component from a liquid stream in which the dissolved component is present in low concentration which comprises passing the liquid stream through a bed of adsorbent until the capacity of the bed for adsorption of the dissolved component from the liquid streams is substantially reached, passing a more concentrated solution of the dissolved component through the bed of adsorbent until it is more highly loaded with the dissolved component, and thereafter passing an eluant through the bed to regenerate the adsorbent and yield an eluate containing the dissolved component in high concentration.

3,979,288
DOUBLE-FLOW MAGNETIC FILTER, APPARATUS AND METHOD

Hans-Günter Heitmann, Erlangen-Buckenhof, and Manfred Schott, Erlangen, both of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim, Germany

Continuation of Ser. No. 460,166, April 11, 1974, abandoned.
This application Apr. 22, 1975, Ser. No. 570,414
Claims priority, application Germany, Apr. 13, 1973, 2318755
Int. Cl.² B01D *35/06*
U.S. Cl. 210—42 S 5 Claims

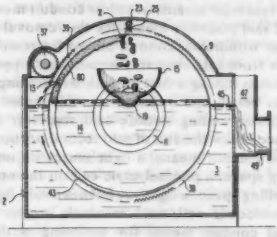


4. A method of removing magnetic impurities from water containing the same and separately discharging said magnetic impurities which comprises maintaining two sections of magnetizable ball-like pellets in a vessel, with one section of pellets above the other section of pellets and a passageway between said sections, said passageway having a multiplicity of openings to permit the flow of liquid into said sections of pellets, introducing said water containing said magnetic impurities into said passageway, passing a portion of said water containing magnetic impurities upwardly through said upper section of magnetizable pellets, passing another portion of said water containing magnetic impurities downwardly through said lower section of magnetizable pellets, producing a magnetic field by electrically energizing an electric coil coaxially surrounding said vessel to cause said magnetic impurities contained in the water to remain on said magnetized pellets, discharging water freed of magnetic impurities as a supply of water for further use, from the top of said upper section of pellets out through the top of said vessel and from the bottom of said lower section out through the bottom of said vessel, and periodically removing accumulated magnetic impurities retained in said vessel by interrupting the flow of said water containing magnetic impurities to said passageway, interrupting said magnetic field, introducing rinsing water at the lower end of said vessel passing said rinsing water upwardly first through said lower and then through said upper sections of pellets, and discharging said rinsing water carrying magnetic impurities from said sections of pellets from the upper end of said vessel.

3,979,289
FILTRATION METHOD

Michael J. Bykowski, Trenton, and Lloyd Ewing, Bayside, both of Wis., assignors to Water Pollution Control Corporation, Milwaukee, Wis.

Continuation of Ser. No. 304,886, Nov. 8, 1972, abandoned.
This application Aug. 23, 1974, Ser. No. 500,213
Int. Cl.² B01D *23/24*
U.S. Cl. 210—79 32 Claims



1. In the process of separating a liquid from solids in an admixture of the two by using an internal rotary filter system comprised of a rotatable hollow drum defining therewithin a filter zone, said filter zone communicating with a liquid collection zone external to the drum through separation is accomplished by presenting the admixture in the filter zone, rotating the drum, causing solids to adhere to the internal portion of the filter medium and causing liquid to flow through the filter medium and to said liquid collection zone, and wherein the separated solids are collected by cotacting the filter medium with a fluid to dislodge the solids from the medium and cause them to collect in a solids collection zone separate from said liquid collection zone, an improved process for lessening the necessity for chemical cleaning and shut-down for cleaning, which process comprises contacting the filter medium with the fluid cycled at at least two different finite pressures including high pressure in the range of about 60 to about 200 psig and low pressure in the range of about 15 to about 60 psig, the duration of the high pressure segment of each cycle being equal to at least about the time required for one complete revolution of said drum, and representing from about 0.5% to about 33% of the total time in each cycle whereby the combination of time, pressures and interval of each within the cycle removes substantially all solids from the filter medium without overburdening the system with fluid.

3,979,290

APPARATUS AND PROCESS FOR CONTROLLING AND REGULATING THE FREEDOM OF SUSPENDED MATTER

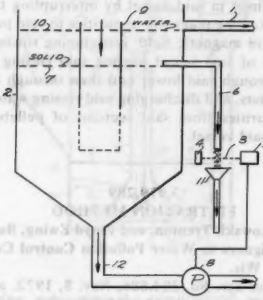
Friedrich Löffler, Bruhl, Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Filed Nov. 25, 1975, Ser. No. 635,267

Claims priority, application Germany, Nov. 27, 1974, 2456011

Int. Cl.² B01D *21/24*

U.S. Cl. 210—83 9 Claims



1. An apparatus for automatically controlling and regulating the freedom from suspended matter of quiescent reservoir overflow liquid in mechanical separatory processes for liquid-solid phases in the sedimentation of suspended particles in quiet or slow flowing liquids comprising in combination a quiescent reservoir means, overflow conduit means, the upper portion of said reservoir means for the removal of clear overflow, upper withdrawal conduit means for removing liquid or suspension from said reservoir means, said upper withdrawal conduit means having a first portion terminating in said reservoir means below said overflow conduit means and having a second portion ending outside said reservoir means, a free falling space below the end of said second portion of the upper withdrawal conduit means, a light source on one side of said free falling space, a photoelectric cell on the opposite side of the free falling space, a light ray between said light source and said photoelectric cell, said reservoir means having lower withdrawal conduit means for removing settled suspended particles, pump means connected to said lower withdrawal conduit means, means driving said pump means and means operatively connecting said photoelectric cell with said driving means whereby when suspended particles pass through said free falling space they interrupt said light ray and the photoelectric cell actuates said pump means to withdraw settled suspended particles through said lower withdrawal conduit means.

3,979,291

OIL BOOM AND METHOD OF SKIMMING FLOATING OIL FROM THE SURFACE OF A BODY OF WATER

Cornelis in 't Veld, Vlaardingen, Netherlands, assignor to National Marine Service, Inc., St. Louis, Mo.

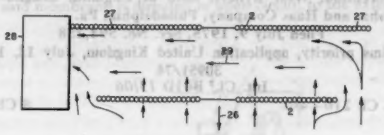
Continuation of Ser. No. 422,603, Dec. 6, 1973, abandoned. This application May 30, 1975, Ser. No. 582,271

Claims priority, application Netherlands, Dec. 7, 1972, 7216633

Int. Cl.² E02B *15/04*

U.S. Cl. 210—84 13 Claims

1. An oil boom for collecting lighter liquid floating on a body of water, the boom comprising at least two rows of multiple, contiguous, elongate, buoyant, vertical members; flexible means securing said vertical members together in generally parallel relationship; a plurality of rigid bracing members; each row of vertical members being retained in spaced-apart, parallel relationship from an adjacent row by the bracing members, the bracing members bridging adjacent rows and being secured to the vertical members by means



enabling the latter to be supported vertically by said bracing members; the upper and lower ends of the vertical members extending above and below the surface of a body of water when the boom is afloat.

3,979,292

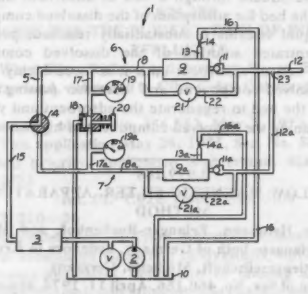
DUPLEX FILTER SYSTEM

Charles W. Kuhn, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 10, 1973, Ser. No. 387,351

Int. Cl.² B01D *35/14*; C02C *1/14*

U.S. Cl. 210—90 1 Claim



1. In a duplex filter system having two fluid circuits, of the type used in an internal combustion engine, said system including, a working fluid circuit, an alternate fluid circuit, fluid conduit means connecting said circuits to said engine, filter means for filtering foreign materials from said fluid passing through each circuit check valve means proximate an outlet of each of said filter means for preventing reversal of fluid flow in said circuits, by-pass means in each of said circuits for selectively by-passing fluid around said filter means, valve means for redirecting fluid flow through the alternate circuit from said working circuit, means for charging said alternate circuit with liquid while draining fluid from said working circuit to permit a change of filter means in said working circuit, the improvement comprising; a fluid flow control system including liquid obstructing air vent means for selectively venting air from said alternate circuit while charging said circuit with liquid, said air vent means operative to cause liquid pressure to build-up within said alternate circuit sufficiently to open said check valve means associated with said alternate circuit and to permit fluid flow through said check valve to a junction of said alternate circuit and said working circuit, and pressure-detecting means for detecting and registering the pressure in each of said circuits and for indicating when said alternate circuit is fully charged with liquid, and for detecting and registering the pressure level in said working circuit after fluid flow has been redirected to said alternate circuit.

3,979,293

APPARATUS FOR THE PURIFICATION OF EFFLUENT

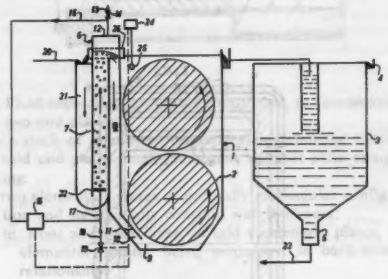
Paul Boulenger, Grenoble, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Division of Ser. No. 477,343, June 7, 1974, Pat. No. 3,945,916. This application Sept. 3, 1975, Ser. No. 610,009

Claims priority, application France, June 25, 1973, 73.23073

Int. Cl.² C02C 1/03

U.S. Cl. 210—96 R 6 Claims



1. An apparatus for the purification of a waste-containing liquid by oxygenation of said waste-containing liquid with an oxygen-enriched gas in contact with a biologically activated sludge, which apparatus comprises:

a. an uncovered main treatment tank for containing a liquor comprising a suspension of the biologically activated sludge in the waste-containing liquid;

b. withdrawing means of the overflow type connected to said treatment tank for withdrawing an effluent portion of the liquor;

c. an inlet receptacle, separate from said main treatment tank, for containing a waste/sludge mixture;

d. feeding means connected to said treatment tank for withdrawing another portion of the liquor from said treatment tank and feeding said portion into said inlet receptacle;

e. introduction means for introducing raw waste-containing liquid into said inlet receptacle;

f. a preliminary oxygenation chamber ensuring flow from said inlet receptacle to said main treatment tank, said preliminary oxygenation chamber comprising:

an ascending flow-path entrance conduit extending inside said inlet receptacle and opening at its lower end into said inlet receptacle,

a descending flow-path discharge conduit extending into said main treatment tank and opening at its lower end into said main treatment tank, and

a gas-accumulation receiver, above said entrance and discharge conduits, in fluid communication with the upper ends thereof;

g. gas injecting means for injecting the oxygen-enriched gas upwardly into said ascending flow-path entrance conduit to oxygenate said waste/sludge mixture within said ascending flow-path entrance conduit; and

h. recycling means for recycling at least a portion of the non-dissolved gas recovered in said gas-accumulation receiver, said recycling means comprising:

a compressor communicating on the suction side with the gas-accumulator receiver and on the delivery side with said gas-injecting means,

wherein said gas-injecting means and said recycling means impart circulation of the oxygenated waste/sludge mixture successively upwardly through said ascending flow-path entrance conduit and downwardly through said descending flow-path discharge conduit into said main treatment tank.

3,979,294

CLARIFICATION PLANT

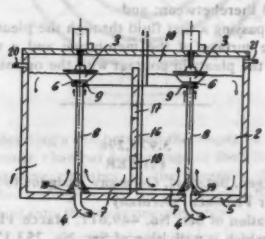
Joseph Richard Kaelin, Villa Seeburg, CH-6374 Buochs, Switzerland

Continuation-in-part of Ser. No. 308,600, Nov. 21, 1972, abandoned. This application Jan. 21, 1975, Ser. No. 542,812

Claims priority, application Switzerland, Nov. 22, 1971, 17043/71

Int. Cl.² C02C 1/10; B01F 3/04

U.S. Cl. 210—195 S 5 Claims



1. In a clarification plant provided with at least one gas-tight activation tank which is provided with a surface ventilation rotor, a re-clarification tank, inlet means for supplying sewage to said activation tank and outlet means for conducting activation sewage to said re-clarification tank, a conduit having one end vertically oriented and disposed in said activation tank directly below said surface ventilation rotor and being connected at its other end to said reclarification tank for recycling activated sludge concentrate from said reclarification tank, an outlet aperture in said one end of said conduit being located in a suction zone of said surface ventilation rotor directly therebelow whereby the activated sludge in said conduit is sucked upward through the suction of said surface ventilation rotor thereinto, the improvement comprising:

means for supplying substantially pure oxygen in a finely divided form to said other end of said conduit for application to the concentrated recycled activated sludge prior to the entry of said concentrated recycled activated sludge into said surface ventilation rotor.

3,979,295

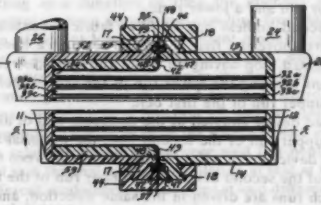
FOLDED MEMBRANE DIALYZER WITH MECHANICALLY SEALED EDGES

Finley W. Markley, Burnsville, Minn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 9, 1975, Ser. No. 566,497

Int. Cl.² B01D 31/00

U.S. Cl. 210—321 B 11 Claims



1. A dialyzer comprising:

a case;

a semipermeable membrane sheet disposed within said case and folded into a stack of very closely spaced pleats, said folded membrane having end edges and serpentine side edges, and said membrane including near each end edge an end portion extending from said stack of pleats;

means for sealingly separating one surface of said membrane from the opposite surface, said sealing means comprising a solidified plastic material surrounding and embedding the side edges of said membrane and clamping means in the form of a pair of mutually opposed case sealing flanges formed on said case engaging the opposite surfaces of the membrane near each of the end edges in sealed relation thereto, and means for pressing said case sealing flanges toward each other with said end portion captured therebetween; and

means for passing a first fluid through the pleats in contact with one surface of the membrane and a second fluid through the pleats in contact with the opposite surface.

3,979,296

FILTER

Wendell Bastgen, Betzdorf, Germany, assignor to Albert Klein KG, Nieder-Fishbach, Germany

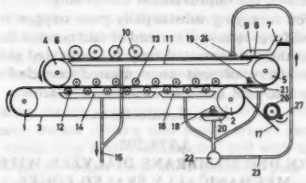
Continuation of Ser. No. 449,611, March 11, 1974, abandoned, which is a division of Ser. No. 253,178, May 15, 1972, Pat. No. 3,800,952. This application Apr. 21, 1975, Ser. No. 569,803

Claims priority, application Germany, June 5, 1971, 2127974

The portion of the term of this patent subsequent to Apr. 2, 1991, has been disclaimed.

Int. Cl.[2] B01D *33/04*; B30B *9/24*

U.S. Cl. 210—324 **27 Claims**



1. A filter for removing liquid from a slurry, comprising:

a. a first endless belt of filter fabric mounted on end rollers so as to form a horizontally-elongated loop having an upper run and a lower run,

b. a second endless belt of filter fabric mounted on end rollers above the first belt so as to form a horizontally-elongated loop having an upper run and a lower run,

c. means pressing the lower run of the second belt against the upper run of the first belt,

d. a feed device situated at the upstream end of and above the upper run of the second belt, the material from the feed device eventually entering the nip between the lower run of the second belt and the upper run of the first belt, which runs are driven in the same direction, and

e. means underlying the upper run of the second endless belt to hold it substantially flat for conveying and preliminary draining of the newly-introduced slurry.

3,979,297

MEMBRANE SUPPORT-PLATES FOR FLUID SEPARATING APPARATUS AND APPARATUS USING SUCH SUPPORT-PLATES

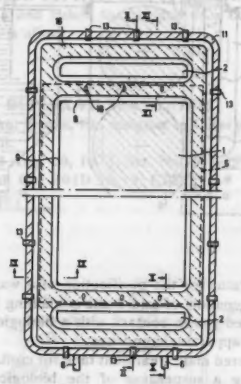
Robert Bardin, Vienne, and André Toulouze, Lyon, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed May 28, 1974, Ser. No. 473,739

Claims priority, application France, May 29, 1973, 7319533

Int. Cl.[2] B01D *31/00*

U.S. Cl. 210—232 **14 Claims**



1. Apparatus for effecting separation by selective permeation, said apparatus comprising two end plates, at least one feed pipeline for the fluid to be treated passing through one of said end plates, at least one pipeline for discharging the untreated fluid passing through the other end plate, at least two support-plates positioned between said end plates, each support-plate comprising, in combination:

a. a generally rectangular support-plate having opposite ends and faces;

b. at least one orifice near one of its ends for the passage of fluid to be treated;

c. at least one cell forming cavity on at least one of its faces;

d. a membrane covering said at least one cell;

e. means communicating said cell with the exterior for discharging the permeate which is passed through the membrane;

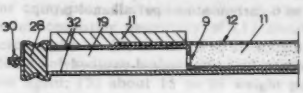
f. a detachable device positioned on each face of the support-plate having a membrane, the device having dimensions substantially as those of the support-plate, and maintaining the membrane over the entire periphery of the cavity and having a central opening in register with the cavity and dimensions substantially those of the cavity, and an orifice in register with the orifice of the fluid to be treated of the support-plates and the dimensions of said orifice of the support plate; and

g. a gasket separating in a fluidtight manner the two support-plates, said gasket being in contact with the detachable device and comprising a central opening in register with the cavity and of substantially the same width as that of the central opening in the detachable device and of which the length is substantially equal to twice the distance between a median plane perpendicular to the longitudinal axis of the support-plates and the part of the orifice of the detachable device most spaced from said median plane.

3,979,298
FLUID SEPARATING APPARATUS

Jacques Breysse, Villeurbanne, and Jean Roget, Lyon, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Continuation-in-part of Ser. No. 326,853, Jan. 26, 1973, abandoned. This application May 28, 1974, Ser. No. 473,677
Claims priority, application France, Jan. 28, 1972, 73.02900
Int. Cl.² B01D 31/00
U.S. Cl. 210—232 10 Claims



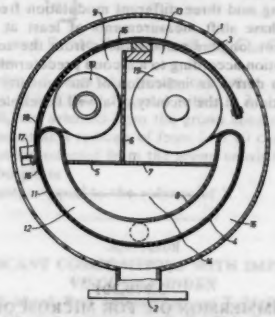
1. Fluid separating apparatus comprising, in combination:
a. two end plates;
b. a stack of membrane support plates clamped between said end plates, each membrane support plate comprising:
i. two elementary plates of generally rectangular configuration and substantially constant wall thickness;
iii. front and back faces on said elementary plates, said elementary plates being assembled in back-to-back relationship;
iii. means joining such elementary plates in fluidtight manner to one another;
iv. at least one orifice extending through each elementary plate in the vicinity of at least one end thereof for the passage of fluid to be treated;
v. first recess defining means on said front face of at least one of said two elementary plates, said recess defining means forming a cell;
vi. means defining a chamber between said back faces of said elementary plates;
vii. means defining perforations through said at least one elementary plate to provide communication between each cell and the associated chamber; and
viii. duct forming means providing communication between the chamber and the edge of the support plate;
c. a membrane support and a membrane located in each cell, with the membrane outermost; and
d. a gasket located between adjacent membranes of adjacent support plates.

3,979,299
PRESSURE FILTER WITH CONTINUOUSLY OR INTERMITTENTLY MOVABLE FILTER CLOTH

Dieter Ruland, Monheim-Hitdorf, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 31, 1974, Ser. No. 493,364
Claims priority, application Germany, Aug. 1, 1973, 2338911
Int. Cl.² B01D 29/02
U.S. Cl. 210—387 4 Claims

1. Apparatus for filtering fluids with a filter cloth wherein the filter cloth is subjected to transport continuously or intermittently over a supporting sieve plate, which comprises:
a. a housing, means mounted in the housing providing therein a pressure chamber for receiving the unfiltered fluid and a filtrate chamber for the filtered fluid, said means comprising said supporting sieve plate for passage therethrough of fluid from the pressure chamber to the filtrate chamber,
b. means within the housing defining a magazine chamber for holding and supplying the filter cloth for said transport over the supporting sieve,
c. means for taking up the filter cloth after the transport thereof over the supporting sieve,
d. filtering means communicating the pressure chamber and the magazine chamber for introduction of filtrate into the magazine chamber for immersion of the filter cloth in the magazine chamber in filtrate before transport of the filter cloth over the supporting sieve, and

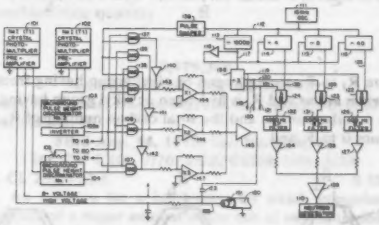


e. means defining a slot between the magazine chamber and the pressure chamber for passage of the filter cloth from the magazine chamber to the pressure chamber, and means for sealing the slot for preventing passage of unfiltered fluid into the magazine chamber.

3,979,300
THREE FREQUENCY MODULATED COMBINATION THERMAL NEUTRON LIFETIME LOG AND POROSITY

Hans J. Paap; Dan M. Arnold, both of Houston, and Michael P. Smith, Bellaire, all of Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 489,330, July 17, 1974. This application May 12, 1975, Ser. No. 576,539
Int. Cl.² G01V 5/00
U.S. Cl. 250—265 24 Claims



1. A method for simultaneously determining the thermal neutron decay time and the porosity of earth formations in the vicinity of a well borehole comprising the steps of:
continuously irradiating the earth formations in the vicinity of a well borehole with a phase coherent harmonically intensity modulated cloud of fast neutrons having at least three different frequency modulation components;
detecting as a function of time the intensity modulated thermal neutron populations resulting from said irradiation of said at least three different modulation frequencies at least at two different longitudinal distances from the source of said irradiation in the borehole;
determining from said detected thermal neutron populations measured as a function of time at said different longitudinal distances from the source of said irradiation, the relative phase shift between said fast neutron cloud and said thermal neutron population at said at least three different modulation frequencies at said different longitudinal distances;
combining said three different modulation frequency relative phase shift measurements at least at one of said

different longitudinal distances according to a first predetermined relationship to derive an indication of the thermal neutron decay time of the earth formations in the vicinity of a well borehole; and

combining said three different modulation frequency relative phase shift measurements at least at two of said different longitudinal distances from the source of said irradiation according to a second predetermined relationship to derive an indication of the porosity of the earth formations in the vicinity of a well borehole.

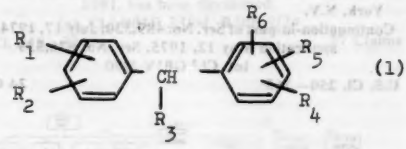
3,979,301

IMMERSION OIL FOR MICROSCOPY

Katsuyoshi Ushioda, Tokyo; Toshikatsu Nishioka, and Hiroshi Okada, both of Chiba, all of Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

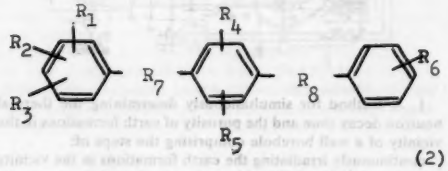
Filed June 17, 1975, Ser. No. 587,693
Int. Cl.² C09K 3/00
U.S. Cl. 252—1 5 Claims

1. An immersion oil for microscopy which comprises 10 to 90 parts by weight of chain hydrocarbon having 200 to 5,000 of molecular weight and 10 to 90 parts by weight of at least one compound selected from the compounds of the following general formula (1), (2), (3):



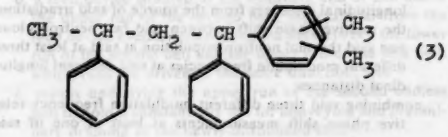
(1)

where R_1 to R_5 are hydrogen or alkyl group having from 1 to 2 carbon atoms and R_6 is hydrogen or alkyl group having from 1 to 4 carbon atoms and the total carbon number of R_1 to R_6 is from 0 to 5; and



(2)

where R_1 to R_3 are hydrogen or alkyl group having from 1 to 4 carbon atoms and the total carbon number of R_1 to R_3 is from 0 to 4 and R_4 to R_6 are hydrogen or methyl group and R_7 to R_8 are alkylene group having from 1 to 3 carbon atoms or methylene group; and,



(3)

3,979,302

OIL AND GASOLINE FIRE EXTINGUISHING COMPOSITION AND METHOD OF MAKING

Alfred R. Globus, Bayside, Long Island, N.Y., assignor to Guardian Chemical Corporation, Hauppauge, N.Y.

Filed Mar. 19, 1974, Ser. No. 452,603
Int. Cl.² A62O 1/00
U.S. Cl. 252—2 16 Claims

1. A composition comprising a polymerized (hydrated amide-amine)complex formed from at least one fatty acid having 8 to 18 carbon atoms and at least one dialkanol amine having 1 to 6 carbon atoms per alkanol group.

3,979,303

OIL WELL DRILLING FLUID

Kenneth Suk Kang, La Jolla, and William H. McNeely, San Diego, both of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 435,145, Jan. 21, 1974, abandoned, which is a continuation of Ser. No. 228,868, Feb. 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 854,322, Aug. 29, 1969, abandoned. This application Jan. 2, 1975, Ser. No. 538,232
Int. Cl.² C09K 7/02
U.S. Cl. 252—8.5 C 11 Claims

1. A water base drilling fluid comprising water and about 0.05 to about 2.25% by weight of the Heteropolysaccharide S-7 said Heteropolysaccharide S-7 having an acetyl content of about 8–10% by weight and the carbohydrate portion thereof consisting of, by weight, about 73% glucose, about 16% rhamnose, and about 11% of a uronic acid, said Heteropolysaccharide S-7 being soluble in water.

3,979,304

METHOD FOR DRILLING AND TREATING SUBTERRANEAN FORMATIONS USING A LOW FLUID LOSS AGENT

Paul W. Fischer, Whittier; David S. Pye, Brea, and Julius P. Gallus, Anaheim, all of Calif., assignors to Union Oil Company of California, Brea, Calif.

Continuation-in-part of Ser. No. 293,388, Sept. 29, 1972, Pat. No. 3,882,029, and a continuation-in-part of Ser. No. 293,389, Sept. 29, 1972, Pat. No. 3,870,668. This application Nov. 20, 1974, Ser. No. 525,366
Int. Cl.² C09K 7/02; E21B 43/26, 43/27
U.S. Cl. 252—8.5 C 8 Claims

1. A method for reducing the permeability of a permeable subterranean formation penetrated by a well bore, which comprises:

preparing an aqueous dispersion by dispersing in an aqueous liquid a fluid loss reducing amount of discrete, slowly oil-soluble, water-insoluble solid particles consisting essentially of a homogeneous solid solution of (1) about 30 to 75 weight percent of wax; (2) about 10 to 25 weight percent of an oil-soluble polyhydroxy higher fatty acid partial ester surface active agent; (3) about 15 to 35 weight percent of a water-dispersible surface active agent selected from the group consisting of polyoxyethylene alkyl phenols, polyethylene glycol higher fatty acid esters, polyoxyethylene polyhydroxy higher fatty acid esters, polyoxyethylene tertiary fatty amines, and polyoxyethylene fatty amide condensates; and (4) about 0.5 to 5 weight percent of a fatty alcohol containing 10 to 14 carbon atoms; and

injecting said dispersion into said well bore and into contact with said formation.

3,979,305

LOW FLUID LOSS ADDITIVE COMPOSITION

Paul W. Fischer, Whittier; David S. Pye, Brea, and Julius P. Gallus, Anaheim, all of Calif., assignors to Union Oil Company of California, Brea, Calif.

Continuation-in-part of Ser. Nos. 293,388, Sept. 29, 1972, Pat. No. 3,882,029, and Ser. No. 293,389, Sept. 29, 1972, Pat. No. 3,870,668. This application Dec. 11, 1974, Ser. No. 531,603

Int. Cl.² C09K 7/02; E21B 43/25; C08F 45/52

U.S. Cl. 252—8.5 C 18 Claims

1. A composition useful in the treatment of subterranean formations comprising discrete particles of a homogeneous solid solution consisting essentially of (1) about 30 to 75 weight percent of wax; (2) about 10 to 25 weight percent of an oil-soluble polyhydroxy higher fatty acid partial ester surface active agent; (3) about 15 to 35 weight percent of a water-dispersible surface active agent selected from the group consisting of polyoxyethylene alkyl phenols, polyethylene glycol higher fatty acid esters, polyoxyethylene polyhydroxy higher fatty acid esters, polyoxyethylene tertiary fatty amines, and polyoxyethylene fatty amide condensates; and about 0.5 to 5 weight percent of a fatty alcohol having 10 to 14 carbon atoms.

3,979,306

METHOD AND COMPOSITION FOR FINISHING CLOTHINGS TO PREVENT YELLOWING

Haruhiko Arai, Narashino, and Junryo Mino, Kamagaya, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1973, Ser. No. 416,194

Claims priority, application Japan, Nov. 21, 1972, 47-116783

Int. Cl.² D06M 13/16, 13/46

U.S. Cl. 252—8.6 3 Claims

1. A clothes starching composition consisting essentially of from 10 to 99 percent of a starching agent selected from the group consisting of carboxymethyl cellulose, starch, polyvinyl alcohol, polyvinyl acetate and mixtures thereof, from 0.001 to 5 percent by weight of an anti-yellowing agent selected from the group consisting of 4,4′-butylidene-bis(6-tert.-butyl-3-methyl-phenol), 2,2-butylidene-bis(6-tert.-butyl-4-methyl-phenol), 4,4′-thio-bis(6-tert.-butyl-3-methylphenol) and 4,4′-thio-bis(6-tert.-butyl-2-methylphenol, and the balance is water.

3,979,307

FABRIC SOFTENER COMPOSITION

Jack H. Kolaian, Wappingers Falls; Ronald E. Jones, Glenham; Wheeler C. Crawford, and William M. Cummings, both of Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 290,687, Sept. 20, 1972, abandoned. This application Sept. 10, 1973, Ser. No. 395,464

Int. Cl.² D06M 13/46

U.S. Cl. 252—8.75 8 Claims

1. A fabric softener composition comprising an aqueous dispersion containing between about 0.1 and 10 wt. % of a di(secondary alkyl) ammonium ester derivative corresponding to the formula:

wherein R_1 and R_2 are the same and are C_{10}–C_{30} secondary alkyl groups:

R_3 is selected from the group consisting of hydrogen, methyl, $(CH_2CH_2O)_nH$ group with $n = 3$;

R_4 and R_5 are selected from the group consisting of alkyl, aryl and aralkyl radicals of from 1 to 10 carbons, and

X is an anion selected from the group consisting of sulfate and phosphate

z is an integer equal to the valence of X.

3,979,308

LUBRICANT COMPOSITIONS WITH IMPROVED VISCOSITY INDEX

Theodore C. Mead, Port Arthur; Richard T. McDill, Houston; Ralph P. Chesluk, and Norman R. Odell, both of Nederland, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 27, 1974, Ser. No. 455,447

Int. Cl.² C10M 1/10, 1/46

U.S. Cl. 252—32.5 5 Claims

1. A lubricating composition comprising a major amount of a mineral lubricating oil and a minor viscosity index improving amount of an adduct of an amine selected from the group consisting of cyclohexyl piperidine, furfuryl amine and amines of the formula:

wherein the substituents are either hydrogen, alkyl or aryl groups having up to 30 carbon atoms with ethyl oleyl acid orthophosphate, the adduct being formed at a temperature of above about 200°F and wherein the amine is present in about a stoichiometric quantity.

3,979,309

LUBRICATING OIL ADDITIVE

Edward M. Geiser, Downers Grove, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 14, 1975, Ser. No. 604,756

Int. Cl.² C10L 1/10, 1/22; C10M 1/44, 3/38

U.S. Cl. 252—32.5 9 Claims

1. An additive for a lubricating oil which comprises an admixture of a major amount of the salt of two equivalents of an N-alkyldiaminoalkane with one equivalent of a dimer dicarboxylic acid and one equivalent of an alkyl acid phosphate, a minor amount of an alkylated hydroxytoluene, and a paraffin oil vehicle.

8. A lubricating oil composition for a two-cycle engine comprising a major proportion of a hydrocarbon lubricating oil and a minor amount of the additive of claim 1.

3,979,310

PROCESS FOR PREPARING FERROMAGNETIC CHROMIUM DIOXIDE

Ugo Montiglio; Giampiero Basile; Pierfrancesco Aspes, and Elio Gallinotti, all of Alessandria, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Apr. 29, 1975, Ser. No. 572,655

Claims priority, application Italy, May 9, 1974, 22489/74

Int. Cl.² C01G 37/02

U.S. Cl. 252—62.51 12 Claims

1. A process for producing ferromagnetic chromium dioxide by thermally decomposing hydrated trivalent chromium chromate, said process comprising preparing a mixture of $Cr_2(CrO_4)_3.nH_2O$ wherein n is between 8 and 12 and antimony

or a compound thereof and wherein the antimony is present in the mixture in an amount corresponding to 0.2 to 1.8% by weight based on the weight of anhydrous $Cr_2(CrO_4)_3$ and heating the mixture to a temperature of 250°-500°C. at a pressure of at least 80 atmospheres.

3,979,311

CORROSION INHIBITOR COMPOSITIONS

Herbert D. Clark, Burbank, Calif., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 30, 1974, Ser. No. 474,568

Int. Cl.² C23F 11/04; C23G 1/06

U.S. Cl. 252—82 **4 Claims**

1. A synergistic mixture of from about 50% to about 70% by weight of ethynyl cyclohexanol and from about 50% to about 30% by weight of N,N'-dicyclohexyl-thiourea.

3,979,312

DETERGENT COMPOSITION CONTAINING NOVEL BLEACHING AGENT

Yunosuke Nakagawa, Koshigaya; Shigetsugu Sugiura, Tokyo; Kinjiro Matsunaga, Funabashi, and Yoshio Ito, Kohriyama, all of Japan, assignors to Kao Soap Co., Ltd. and Nippon Peroxide Co., Ltd., both of Tokyo, Japan

Filed July 7, 1975, Ser. No. 593,203

Claims priority, application Japan, July 12, 1974, 49-79967

Int. Cl.² C11D 3/395, 7/54

U.S. Cl. 252—99 **3 Claims**

1. A substantially neutral detergent composition having a pH of about 6 to about 8, consisting essentially of

from about 3 to about 40 percent by weight of $4Na_2SO_4.2H_2O_2.NaCl$,

from about 3 to about 50 percent by weight of water-soluble anionic surfactant, or water-soluble nonionic surfactant, or water-soluble amphoteric surfactant, or mixtures thereof,

from about 10 to about 90 percent by weight of water-soluble neutral inorganic detergent builder or filler salt,

from zero to about 20 percent by weight of water-soluble alkaline inorganic detergent builder salt, with the proviso that the amount of said water-soluble alkaline inorganic builder salt is such that the pH of the detergent composition is not higher than about 8, and

from zero to about 10 percent by weight of water-soluble organic detergent builder,

the detergent composition being free of activator for said $4Na_2SO_4.2H_2O_2.NaCl$.

3,979,313

BLEACHING COMPOSITION

Yunosuke Nakagawa, Koshigaya; Shigetsugu Sugiura, Tokyo; Kinjiro Matsunaga, Funabashi, and Yoshio Ito, Kohriyama, all of Japan, assignors to Kao Soap Co., Ltd. and Nippon Peroxide Co., Ltd., both of Tokyo, Japan

Filed July 7, 1975, Ser. No. 593,201

Claims priority, application Japan, Oct. 3, 1974, 49-114129

Int. Cl.² C11D 7/54, 7/18, 7/56

U.S. Cl. 252—99 **9 Claims**

1. A bleaching composition consisting essentially of from about 20 to about 100 percent by weight of a mixture of

1. $4Na_2SO_4.2H_2O_2.NaCl$, and

2. an activating agent capable of reacting with hydrogen peroxide in aqueous solution to form an organic peracid,

wherein the weight ratio of (2) / (1) is from 99/1 to 1/99,

from zero to about 10 percent by weight of water-soluble anionic surfactant, or water-soluble nonionic surfactant or mixtures thereof,

from zero to about 80 percent by weight of water-soluble neutral inorganic detergent builder or filler salt,

from zero to about 30 percent by weight of water-soluble alkaline inorganic detergent builder salt, and

from zero to about 10 percent by weight of water-soluble organic detergent builder.

3,979,314

DETERGENT COMPOSITIONS

Terence Frederick Child, Wirral, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Aug. 14, 1974, Ser. No. 497,425

Claims priority, application United Kingdom, Aug. 15, 1973, 38646/73

Int. Cl.² C11D 3/12

U.S. Cl. 252—140 **13 Claims**

1. A detergent composition comprising from about 5% to about 40% of a synthetic anionic, nonionic, amphoteric or zwitterionic detergent active compound, from about 10% to 75% of sodium or potassium carbonate detergency builder and from about 5% to about 60% of finely divided precipitated calcium carbonate prepared by passing carbon dioxide into a suspension of calcium hydroxide, said calcium carbonate having a surface area of from about 30 to about 100 square meters per gram (m^2/g) treated before drying with a water insoluble inorganic dispersing aid selected from the group consisting of natural montmorillonite-type clays and synthetic montmorillonite-type materials, in an amount of about 1% to about 50% by weight based on the weight of the calcium carbonate, said treated calcium carbonate having a decreased tendency to aggregation and deposition on washed fabrics.

3,979,315

METHOD FOR TREATING SCALE

Jack F. Tate; Russell D. Shupe, and Jim Maddox, Jr., all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,960

Int. Cl.² C02B 5/06

U.S. Cl. 252—180 **4 Claims**

1. A method of controlling the build-up of inorganic mineral scale deposits in an aqueous system which comprises incorporating into said system a scale-treating composition consisting essentially of a sulfonated, ethoxylated compound having the general formula:

$$R(OCH_2CH_2)_nSO_3A^+$$

wherein R is an alkylphenyl group containing from about 6 to about 18 carbon atoms in the alkyl portion thereof, n is a number from one to about 10, including fractions, and A^+ is a monovalent cation selected from the group consisting of sodium, potassium, and ammonium, and mixtures thereof, in a concentration of from about 0.0005% to about 0.005%, on a weight basis.

3,979,316

PELLETED SULFUR COMPOSITIONS AND PROCESSES FOR THEIR PRODUCTION

Henning Bartzsch, Hannover, Germany, assignor to Kali-Chemie Aktiengesellschaft, Hannover, Germany

Filed Sept. 27, 1973, Ser. No. 401,502

Claims priority, application Germany, Sept. 27, 1972, 2247371

Int. Cl.² C09K 3/00

U.S. Cl. 252—189 **6 Claims**

1. A process for the production of a pelleted sulfur composition consisting essentially of particles of sulfur which include a substantial proportion of carbondisulfide-insoluble sulfur particles which comprises subjecting the sulfur particles to a simple mixing operation in a high-intensity mixing apparatus together with a binder consisting essentially of a rubber plasticizing oil whose surface tension has been reduced by an amount of an anionic or nonionic surfactant, the amount of the surfactant being equivalent to between 0.5 and 10% by weight of the total mixture and the amount of the plasticizing oil being equivalent to between 10 and 60% of the weight of

the total mixture, and continuing the mixing until the mixture is formed into pellets.

3,979,317

VOLATILE CLEANING SOLUTION FOR PHOTORECEPTORS

Dominic J. Angelini, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 28, 1975, Ser. No. 572,038

Int. Cl.² C09D 9/04

U.S. Cl. 252—170 **12 Claims**

1. A method of cleaning insulating photoconductive photoreceptor surfaces comprising providing a filmed photoconductive insulating photoreceptor surface, applying a cleaning solution which consists essentially of a lower alcohol, water and 3,5-dimethyl-1-hexyn-3-ol surfactant, with the proviso that the ratio of said alcohol to said water is 30–90 parts of said alcohol per 70–10 parts said water and that said surfactant comprises 0.1–50 parts per 100 parts of said solution.

3,979,318

STABILIZED SODIUM PERCARBONATE COMPOSITION

Fumikatsu Tokiwa, Sakura, and Takehiko Kobayashi, Zushi, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Dec. 13, 1974, Ser. No. 532,414

Claims priority, application Japan, Dec. 20, 1973, 48-143092

Int. Cl.² C01B 15/10

U.S. Cl. 252—186 **11 Claims**

1. A stabilized sodium percarbonate composition consisting essentially of particles of sodium percarbonate uniformly coated with a film of a hydrophobic liquid organic compound in an amount of from about 5 to about 10 weight percent, based on the weight of said sodium percarbonate particles, said hydrophobic liquid organic compound having a melting point below about 15°C, a boiling point above about 100°C, and being non-reactive to and being a non-solvent for sodium percarbonate and sodium perborate, said hydrophobic liquid organic compound forming a moisture-resistant coating film on said sodium percarbonate particles, said composition also containing from about 5 to about 20 weight percent of a fine powder of sodium perborate, based on the weight of said sodium percarbonate particles, said sodium perborate particles being of smaller size than said sodium percarbonate particles and being mixed in or adhered to said film.

3,979,319

LIQUID CRYSTAL COMPOSITION

Masakazu Fukai, Nishinomiya; Komei Asai, Hirakata; Selichi Nagata, Sakai; Hiroshi Tatsuta, Katano, and Koshiro Mori, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

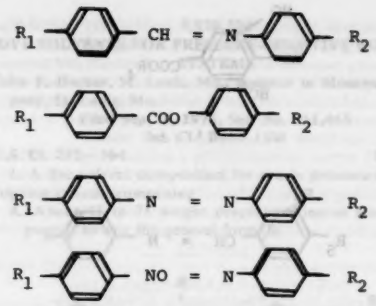
Filed Apr. 4, 1973, Ser. No. 347,632

Claims priority, application Japan, Apr. 5, 1972, 47-34764; Apr. 5, 1972, 47-34765; Apr. 5, 1972, 47-34766; Apr. 5, 1972, 47-34767; Apr. 5, 1972, 47-34768; Apr. 5, 1972, 47-34769; Apr. 5, 1972, 47-34770

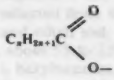
Int. Cl.² C09K 3/34

U.S. Cl. 252—299 **2 Claims**

1. A liquid crystal composition consisting essentially of a nematic liquid crystal compound selected from the group consisting of compounds of the formula,

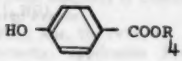


wherein R_1 and R_2 represent C_nH_{2n+1}—, $C_nH_{2n+1}O$— or

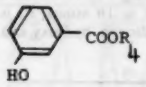


functional group ($1 \leq n \leq 7$) or mixture thereof and 0.1% to 5% by weight, based on said liquid crystal compounds, of at least one additive compound selected from the group consisting of compounds of the formula,

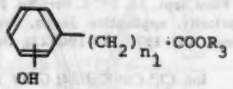
(1)



(2)



(3)



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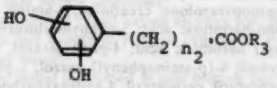
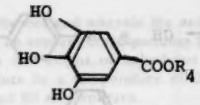
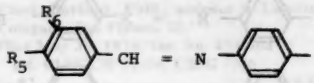
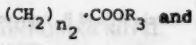
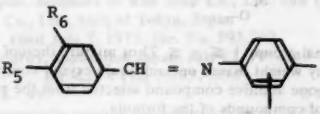
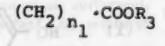


(5) 

(6) 



(7) 



wherein R_3 is selected from the group consisting of hydrogen and a normal alkyl group having 1 to 18 carbon atoms; R_4 is a normal alkyl group having 1 to 18 carbon atoms; R_5 is selected from the group consisting of hydrogen, hydroxy, a normal alkyl group having 1 to 16 carbon atoms and a normal alkoxy group having 1 to 16 atoms; R_6 is selected from the group consisting of hydrogen, hydroxy and nitro; n_1 is for 1 or 2 and n_2 is 0, 1 or 2.

3,979,320

LIQUID CRYSTAL COMPOSITION

Minoru Ozutsumi; Yoshitake Ohnishi; Yoshihide Miyazawa, and Michihiro Gonda, all of Tokyo, Japan, assignors to Hodogaya Chemical Co., Ltd. and Nippon Electric Company, Ltd., both of Tokyo, Japan

Filed Sept. 18, 1974, Ser. No. 507,130

Claims priority, application Japan, Sept. 22, 1973, 48-106521; Sept. 22, 1973, 48-106522; Oct. 30, 1973, 48-121928

Int. Cl.² C09K *3/34*; G02F *1/13*

U.S. Cl. 252—299 **27 Claims**

1. A liquid crystal composition capable of spontaneously forming therein a homogeneous alignment of liquid crystalline molecules, which comprises a liquid crystal material and an additive consisting of at least one five- or six-membered heterocyclic compound selected from the group consisting of isatin; 2,5-diketopiperazine; 1-phenyl-2,5-diketopiperazine; 1,4-diphenyl-2,5-diketopiperazine; 3-aminopyrazolone; 1-phenyl-3-aminopyrazolone; creatinine; α-amino -γ-butyrolactam; 5-amino-barbituric acid; 5-phenylbarbituric acid; 5-(σ-aminophenyl) barbituric acid; 4-phenylurazol; 4-(p-hydroxyphenyl) urazol; 4-(p-aminophenyl) urazol; 1-phenylurazole; 4-methylcarbostyril; carbostyril; 4-hydroxycarbostyril; hydantoin; hydantoin imide-(2); hydrouracil; 2,4-tetrahydroquinazoline-dion; 3-methylpyrazolone; 1,2,4-triazole-5-thiol; 1,2,4-triazole-3,5-dithiol; 1-(m-chlorophenyl) barbituric acid; isatoic acid anhydride; 2-hydroxypyridine; 3-amino-1,2,4-triazolo[1,2-d] barbituric acid; 8-hydroxyquinoline; tautomeric isomers of the above mentioned compounds, and mixtures of two or more of the above mentioned compounds.

11. The liquid crystal composition as claimed in claim **1**, which further contains a reversible or oxidation-reduction system in the form of a supplementary additive consisting of at least one substance selected from the class consisting of

a. mixtures of at least one quinone compound and at least one quinone compound wherein oxo groups of the quinone compound are substituted by hydroxyl groups;

b. organic cyclic compounds having at least one radical selected from the group consisting of hydroxyl and amino radicals and at least one radical selected from the group consisting of carbonyl and imino radicals, and;

c. mixtures of at least one organic cyclic compound as defined in the above Item (b) and at least one compound selected from the group consisting of the quinone compounds and the substituted quinone compounds as defined in the above Item (a).

3,979,321

MIXTURE OF LIQUID CRYSTALS EXHIBITING POSITIVE DIELECTRIC ANISOTROPY AND A WIDE MESOMORPHIC RANGE

André Couttet; Jean Claude Dubois, and Annie Zann, all of Paris, France, assignors to Thomson-CSF, Paris, France

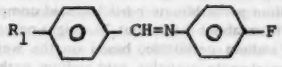
Filed June 11, 1975, Ser. No. 585,869

Claims priority, application France, June 14, 1974, 74.20714

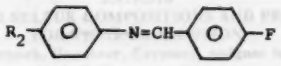
Int. Cl.² C09K *3/34*; G02F *1/13*

U.S. Cl. 252—299 **6 Claims**

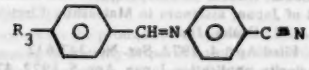
1. A eutectic mixture of liquid crystals consisting essentially of at least one compound selected from the formulae:



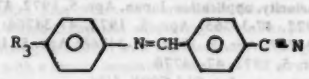
where R_1 is C_4H_9O, $C_6H_{13}O$ or $C_8H_{17}O$ or



where R_2 is C_5H_{11}, C_6H_{13} or C_7H_{15}, and mixtures thereof, mixed with at least one compound selected from the formulae:

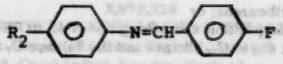


and

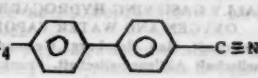


where R_3 is $C_6H_{13}O$ or $C_8H_{17}O$ and mixtures thereof.

2. A eutectic mixture of liquid crystals consisting essentially of at least one compound of the formula:



where R_2 is C_9H_{11}, C_8H_{13} or C_7H_{15} mixed with at least one compound of the formula:



where R_4 is C_5H_{11}, C_5H_7O, $C_5H_{11}O$, $C_8H_{17}O$ or $C_7H_{15}O$.

3,979,322

PHOSPHATE GLASS FOR LASER USE

Nikolai Efimovich Alexeev, ulitsa Gorkogo 8, korpus 1, kv. 21, Moscow; Igor Mikhailovich Buzhinsky, ulitsa Pervomaiskaya 5, kv. 46, Lytkarino Moskovskoi oblasti; Mark Efremovich Zhabotinsky, ulitsa Pogodinskaya 2/3, kv. 53, Moscow; Anatoly Andreevich Izyneev, ulitsa Vokzalnaya, 19, kv. 18, Fryazino Moskovskoi oblasti; Elizaveta Ivanovna Koryagina, ulitsa Oktyabrskaya 15, kv. 31, Lytkarino Moskovskoi oblasti; Valery Borisovich Kravchenko, ulitsa Lenina 14, kv. 47, Fryazino Moskovskoi oblasti; Jury Petrovich Rudnitsky, ulitsa Ostrovityanova 31, kv. 298, Moscow; Valentin Pavlovich Gapontsev, ulitsa Godovikova 1, kv. 110, Moscow, and Vadim Vasilievich Tsapkin, Tatarskaya ulitsa 4, kv. 14, Moscow, all of U.S.S.R.

Filed Apr. 9, 1973, Ser. No. 349,669

Int. Cl.² C09K *11/10, 11/08, 11/42;* C03C *3/00*

U.S. Cl. 252—301.6 P 6 Claims

1. A glass for laser use having the following mol percentage composition:

phosphorus pentoxide — 35–49;

oxides of one or more alkali metals — 1–30;

oxides of one or more metals of group II — 20–45;

neodymium oxide — 0.1–25;

oxides of elements selected from the group consisting of B, Al, Nb and Pb — 0–27;

the ratio of the sum total of the oxides of mono-, bi- and trivalent metals to the phosphorus pentoxide being in excess of unity, said glass having a thermal refractive index coefficient of $(-30$ to $+20) \cdot 10^{-7}$ deg^{-1} and a cross-sectional area of stimulated radiation of 1.10^{-20} to 5.10^{-20} cm².

3,979,323

METHOD OF MAKING A BITUMINOUS EMULSION

John Spahr, c/o P.O. Box 1457, Lafayette, Ind. 47902; Kenneth E. McConnaughay, deceased, late of Lafeyette, Ind., by Esther L. McConnaughay, executrix, 1205 Hayes St., West Lafayette, Ind. 47906

Filed Aug. 20, 1973, Ser. No. 389,802

Int. Cl.² B01J *13/00*

U.S. Cl. 252—311.5 5 Claims

1. A method of making a bituminous emulsion comprising the steps of mixing a straight chain fatty acid containing from 11 to 20 carbon atoms with a water solution of a base having a pH in range of from about 7.5 to about 9.0 to produce a water dispersion of said acid, said water solution containing at least 9 parts of water to one part of said acid, mixing said dispersion with an aminoethyl substituted imidazoline to form an emulsifier, said imidazoline containing an alkyl radical containing from 10–19 carbon atoms, said dispersion being mixed with said imidazoline to provide from about 1.5 to about 2.5 parts of said fatty acid to one part imidazoline, dissolving said emulsifier in water and emulsifying it with a petroleum bitumen to form the finished emulsion, said bitumen being added in an amount to constitute from about 60% to about 75% of said emulsion and said emulsifier being added in an amount of from about 0.5% to about 2% based upon the weight of the bitumen.

3,979,324

DYE SOLVENTS FOR PRESSURE-SENSITIVE COPYING SYSTEMS

John F. Herber, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

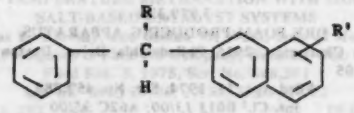
Filed Sept. 8, 1975, Ser. No. 611,465

Int. Cl.² B01F *1/00*

U.S. Cl. 252—364 5 Claims

1. A dye solvent composition for use in pressure-sensitive copying systems comprising

A. About 45 to 75 weight percent of one or more compounds having the general formula



wherein R and R′ can be the same or different and are selected from the group consisting of hydrogen, methyl and ethyl; and

B. about 55 to 25 weight percent of

i. hexylbenzene; or

ii. a composition comprising about 45 to 75 weight percent C_{10} to C_{16} alkanes and the balance C_7 to C_{10} alkylbenzenes.

3,979,325

WINDOWLESS CRYOSTATIC DEVICE FOR LOW-TEMPERATURE SPECTROMETRY

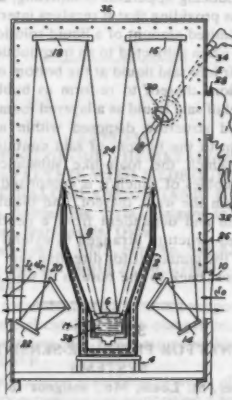
Maurice Ceccaldi, Chatillon, and Pierre Roubeau, Palaiseau, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 10, 1975, Ser. No. 566,700

Claims priority, application France, Apr. 22, 1974, 74.13951

Int. Cl.² G01J *3/02*

U.S. Cl. 250—352 9 Claims



1. A windowless cryostatic device for low-temperature spectrometry and primarily employed in infrared spectrometry, wherein said device comprises:

a vertically oriented vessel having an open top, heat-insulating walls and a bottom portion capable of containing a cryogenic liquid;

a cryogenic liquid contained in said bottom portion of said vessel;

a bell-shaped housing encapsulating the vessel, said housing defining an interior chamber containing said vessel, said housing provided with at least one aperture, said aperture being such as to establish an area of communication between a point external to said housing and said interior chamber, said area of communication being a spaced distance below the open top of said vessel;

support means for maintaining a sample to be studied in a position above said cryogenic liquid such as to ensure that said sample is cooled by said support means, said support means being cooled by the cryogenic liquid;

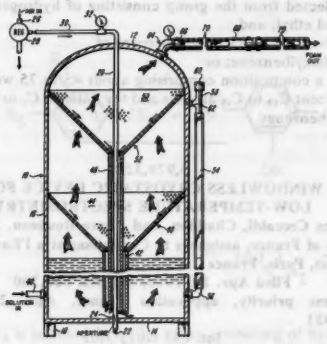
means for introducing the cryogenic liquid into the vessel.

3,979,326

DRY FOAM PRODUCING APPARATUS

James Chatterton, 2916 Philadelphia Drive, Dayton, Ohio 45405

Filed Apr. 11, 1974, Ser. No. 459,882
Int. Cl.² B01J 13/00; A62C 35/00
U.S. Cl. 252—359 E 14 Claims



1. Foam producing apparatus comprising, a container having inlet means providing that it receives interiorly thereof, in its bottom, a limited amount of a liquid solution having foaming properties when subjected to an introduction of air, means for injecting air into said liquid at the bottom of said container to cause portions thereof to re-form as bubbles and to rise above the level of said liquid as a layered foam-like substance, multi-apertured structure disposed within and in elevated spaced relation to the bottom of said container through the apertures of which the foam-like substance is forced to squeeze the bubbles of which it is comprised, thereby to extract liquid from the walls thereof, and tubular guide means connected with and dependent from a central area of said multi-apertured structure arranged to extend substantially to the bottom of the container for directing said extracted liquid in a guided flow, back to the bottom of said container.

3,979,327

DYE SOLVENTS FOR PRESSURE-SENSITIVE COPYING SYSTEMS

John F. Herber, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Sept. 8, 1975, Ser. No. 611,116
Int. Cl.² B01F 1/00
U.S. Cl. 252—364 4 Claims

1. A dye solvent composition for use in pressure-sensitive copying systems comprising:

A. About 45 to 55 weight percent of hydrogenated terphenyl having no greater than about 40% hydrogenation; and

B. About 55 to 45 weight percent of

i. hexylbenzene; or

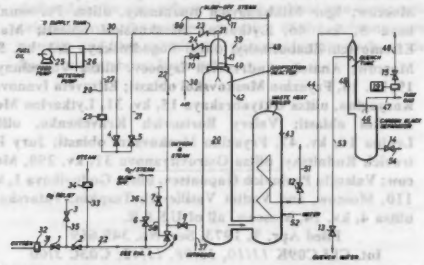
ii. a composition comprising about 45 to 75 weight percent C_{10} to C_{16} alkanes and the balance C_7 to C_{10} alkylbenzene.

3,979,328

AUTOMATIC CONTROL FOR PROCESS FOR THERMALLY GASIFYING HYDROCARBONS WITH OXYGEN AND WATER VAPOR

Günther Pockrandt, Bad Homburg, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 12, 1974, Ser. No. 523,191
Claims priority, application Germany, Dec. 6, 1973, 2360757
Int. Cl.² C01B 2/14
U.S. Cl. 252—373 4 Claims



1. In a process for thermally gasifying hydrocarbons with oxygen and steam under pressure in the range of 3–100 kilograms per square centimeter and at temperatures in the range of about 1000–1500°C wherein the gasification reaction is carried out in a reactor having temperature measuring means, valved conduits for the supply of hydrocarbons, oxygen, steam and an inert purging gas, and valved blow-off conduits for venting oxygen and steam, the hydrocarbon supply conduit connecting a nozzle in the reactor and a hydrocarbon supply tank and having a feed pump and a valved recycle conduit for returning hydrocarbon to the supply tank from the hydrocarbon supply conduit, and the product gas from the gasification reactor is cooled and scrubbed, the improvement which comprises carrying out the following sequence of steps during start-up of the gasification reactor via an electric circuit as shown in FIGS. 3 and 4:

i. receiving at a first electronic gate device (80) signals (S2) and (S4) indicating that the hydrocarbon feed pump (26) is energized and the blow-off conduit (36) is open;

ii. sending a signal via switch (81) to said first gate device (80) whereupon said first gate device emits a signal (S5) causing the hydrocarbon recycle conduit (30) to open via valve (4) and the hydrocarbon supply conduit (21) to close via valve (5) thereby causing hydrocarbons normally fed to the reactor to be recycled;

iii. the closing of the hydrocarbon supply conduit (21) emitting a signal (S61) causing at least the opening of the oxygen supply conduit (31) via valve (1);

iv. receiving signals (S8), (S9), (S13) and (S14) at a second gate device (82) from the supply conduits for hydrocarbons (21), oxygen (31) and steam (33) whereupon a signal (S17) is given to initiate a second signal via switch (86) which causes the purge gas supply conduit (37) to open via valve (9), the hydrocarbon supply conduit (21) to open via valve (5) and the oxygen and steam supply conduit (22) to open via valve (8); and

v. the opening of the oxygen and steam supply conduit (22) emitting signal (S25) causing the purge gas conduit (37) to close via valve (9) and the blow-off conduit (36) to close via valve (6).

3,979,329

CARBON MOLECULAR SIEVE CATALYST

Barry John Cooper, London, England, assignor to Johnson Matthey & Co., Limited, London, England

Continuation of Ser. No. 97,043, Dec. 10, 1970, Pat. No. 3,793,224. This application Feb. 19, 1974, Ser. No. 443,787

Claims priority, application United Kingdom, Dec. 12, 1969, 60743/69

Int. Cl.² B01J *37/00, 29/02, 21/18, 23/42*

U.S. Cl. 252—422 2 Claims

1. A method of preparing a selective catalyst which includes the steps of treating furfuryl alcohol with an aqueous solution of chloroplatinic acid, warming the mixture to initiate polymerisation of the alcohol, drying the polymer by heating under nitrogen, curing the polymer by heating to 200°C for 16 hours and carbonising the polymer by heating to 650°C for four hours, both the curing and carbonising steps being carried out under nitrogen.

2. A method of preparing a selective catalyst which includes the steps of heating furfuryl alcohol in an aqueous solution of chloroplatinic acid to polymerise said furfuryl alcohol, curing the polymer and carbonising the same, the curing and carbonising being carried out in an inert atmosphere.

3,979,330

CARBON CONTAINING MOLECULAR SIEVES

Heinrich Münzner, Essen-Kray; Heinrich Heimbach, Bochum; Werner Körbacher, Essen-Borbeck; Werner Peters, Wattenscheid; Harald Jüntgen, Essen-Heisingen; Karl Knoblauch, Essen, and Dieter Zündorf, Essen-Heisingen, all of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Division of Ser. No. 161,211, July 9, 1971, Pat. No. 3,801,513. This application Feb. 21, 1974, Ser. No. 444,381

Claims priority, application Germany, Apr. 23, 1971, 2119829

The portion of the term of this patent subsequent to Apr. 2, 1991, has been disclaimed.

Int. Cl.² C01B *13/00*

U.S. Cl. 252—445 21 Claims

1. In a process for the production of a carbon-containing molecular sieve, the step of contacting particulate coke having pores of a first effective size with a carbonaceous gaseous substance when said coke has a temperature in excess of about 600°C, said carbonaceous substance splitting off carbon at said temperature, and said carbon being at least partially deposited in said pores to thereby reduce the effective size of said pores from said first effective size to a smaller second effective size.

3,979,331

CATALYST FOR ALKYLATING AROMATIC HYDROCARBONS

George E. Stridde, Houston, Tex., assignor to NL Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 503,985, Sept. 6, 1974. This application Dec. 6, 1974, Ser. No. 530,092

The portion of the term of this patent subsequent to June 22, 1992, has been disclaimed.

Int. Cl.² B01J *27/06, 29/00, 29/06*

U.S. Cl. 252—441 5 Claims

1. A catalyst comprising a synthetic hectorite-type clay containing a metallic cation having a Pauling electronegativity greater than 1.0 in cation exchange positions on the surface of said clay, said catalyst having the following structural formula:

$$[(M_{6-z}^{z+}Li_z^{+})^{IV}Si_8O_{20}(OH)_{4-y}F_y](x-z)R^z$$

where

$0.33 \leq x \leq 1$

$0 \leq y \leq 4$

M is one or more divalent cations having an ionic radius not greater than 0.75 A, provided that M is less than 95 mole percent Mg, and

R is at least one of said metallic cations having a Pauling electronegativity greater than 1.0 of valence z.

3,979,332

HIGH TEMPERATURE METHANATION WITH MOLTEN SALT-BASED CATALYST SYSTEMS

Thomas E. Klovsky, and Milton M. Wald, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 3, 1975, Ser. No. 546,371

Int. Cl.² B01J *27/08, 27/10, 27/20, 27/22*

U.S. Cl. 252—441 19 Claims

1. A molten metal salt-based catalyst system which is active in promoting methanation at reaction temperatures above 500°C comprising a molten metal salt carrier selected from the class consisting of the halides and carbonates of alkali metals and alkaline earth metals and the halides of zinc, copper, manganese, cadmium, tin and iron, and mixtures thereof, melting below 1000°C; said molten salt having dispersed therein one or more catalytically active forms of iron selected from the class consisting of finely divided elemental iron, iron oxides, iron carbides or mixtures thereof.

8. A molten metal salt-based catalyst system which is active in promoting methanation at reaction temperatures above 500°C comprising a molten iron halide carrier, said iron halide carrier having a minor amount of an alkali metal halide selected from the class consisting of sodium chloride and potassium chloride added thereto as a melting point depressant whereby the melting point of the resulting carrier is below 1000°C; said resulting iron halide carrier having dispersed therein one or more catalytically active metals selected from the class consisting of iron, molybdenum, manganese, nickel, cobalt, zinc, titanium, silver, copper and thorium in the form of finely divided elemental metals, metal oxides, metal carbides, or mixtures thereof.

3,979,333

ACTIVATING GROUP VIII METAL/ALUMINA CATALYSTS WITH HYDROGEN HALIDE/HALOSILANE/ORGANIC HALIDE

John W. Myers, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 3, 1975, Ser. No. 546,820

Int. Cl.² B01J *27/08, 27/10*

U.S. Cl. 252—441 12 Claims

1. A method for activating an alumina supported Pt, Ir, Os, Ru, Rh, or Pd metal catalyst which comprises:

heating said catalyst at a temperature within the range of 500° to 1600° F.;

contacting said catalyst at said temperature of 500° to 1600° F. with a dry activating gas comprising a hydrogen halide selected from the group consisting of HCl and HBr, a halosilane selected from the group consisting of chlorosilanes and bromosilanes, and an organic halide selected from the group consisting of chlorinated paraffins and brominated paraffins for a time sufficient to impart a halide content to the catalyst and to increase the activity of the catalyst, the weight ratio of said halosilane to said organic halide being within the range of 0.1:1 to 10:1; and

thereafter cooling said thus-contacted catalyst.

3,979,334

MANUFACTURE OF SPHEROIDAL ALUMINA PARTICLES

Richard K. Lee, Palatine, and John C. Foley, Waukegan, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Apr. 16, 1975, Ser. No. 568,765
Int. Cl.² B01J 37/00
U.S. Cl. 252—448 10 Claims

1. A method of manufacturing spheroidal alumina particles which comprises:

a. commingling an acidic alumina hydrosol with an ammonia precursor at below gelation temperature and forming a mixture comprising from about 6 to 10 wt. % aluminum and from about 1:1 to about 1.5:1 weight ratio of aluminum to the acid anion content thereof, said precursor being hydrolyzable to ammonia with increasing temperature, and aging the mixture with stirring at a temperature of from 2° to about 25°C. for a period of from about 1 to about 4 hours;

b. dispersing the aged mixture as droplets in a hot oil bath and forming hydrogel spheres therein;

c. aging said spheres at an elevated temperature effecting decomposition of the residual ammonia precursor contained therein; and

d. washing, drying and calcining the aged spheres.

3,979,335

PROCESS FOR THE PREPARATION OF SYNTHETIC ZEOLITES

Georgy Anatolievich Golovko, Pushkin, bulvar A.Tolstogo, 16, kv. 29, Leningrad; Boris Alexandrovich Lipkind, ulitsa Burevestnika, 9, kv. 3; Albina Timofeevna Slepneva, ulitsa L.Tolstogo, 5, kv. 50, both of, Gorky; Alexandr Semenovich Leontiev, ulitsa Gagarina, 13, kv. 13, Salavat, Bashkirskaya ASSR; Vladimir Mikhailovich Mazin, ulitsa Michurinskaya, 111, kv. 54, Tambov; Elena Nikolaevna Berezovskaya, ulitsa Engelsa, 13, kv. 67, Gorky; Valentin Alexandrovich Burylov, ulitsa Kuibysheva, 7, kv. 69, Gorky; Alexandr Mikhailovich Zubkov, ulitsa Geroev Kosmosa, 7, kv. 148, Gorky; Olga Alexeevna Konakova, ulitsa Nevzorovoi, 39, kv. 8, Gorky; Alexandr Ivanovich Judaev, ulitsa Pushkina, 22, kv. 4, Salavat, Bashkirskaya ASSR; Valentin Nikolaevich Pavlychev, ulitsa Chapaeva, 9, kv. 7, both of Salavat, Bashkirskaya ASSR; Jury Yakovlevich Ignatov, ulitsa Kolomenskaya, 33/40, kv. 59, and Evgeny Alexandrovich Kharitonov, ulitsa Petra Lavrova, 21, kv. 5, both of Leningrad, all of U.S.S.R.

Filed Dec. 27, 1974, Ser. No. 537,110
Int. Cl.² B01J 29/06
U.S. Cl. 252—455 Z 10 Claims

1. A process for the preparation of synthetic zeolite pellets of high mechanical strength and dynamic activity comprising mixing zeolite powder of a particle size not exceeding 5 mcm with a natural clay binder of a particle size of 250–500 A; wetting the resulting mixture with water and pelletizing the same; and calcining the resulting pellets at 600°–700°C.

3,979,336

CATALYST FOR DISSOCIATION OF AMMONIA AND METHOD OF PREPARING SAME

Evgeny Zinovievich Golosman, ulitsa L. Tolstogo, 46/1, kv. 1; Viktor Stanislavovich Sobolevsky, ulitsa Moskovskaya, 2/14, kv. 5; Viktor Petrovich Lytkin, ulitsa Trudovye rezervy, 70b, kv. 95; Nikolai Nikitovich Axenov, ulitsa Druzhby, 19a, kv. 26; Alexandra Ivanovna Golovkova, ulitsa Komsomolskaya, 6, kv. 35, all of Novomoskovsk, Tulskoi oblasti; Yakov Anatolievich Peker, ulitsa Admirala Lazareva, 12, kv. 20; Dmitry Ivanovich Zinchenko, prospekt Mira, 9, kv. 54, both of Lipetsk, and Sergei Ivanovich Ruzinsky, poselok 25-letia Khimkombinata, ulitsa Azotchikov, 4, Novomoskovsk, Tulskoi oblasti, all of U.S.S.R.

Filed Dec. 10, 1974, Ser. No. 531,282
Int. Cl.² B01J 29/06, 29/10; C01B 2/02
U.S. Cl. 252—455 R 2 Claims

1. A catalyst for dissociation of ammonia consisting of oxides of iron, aluminium oxide, calcium oxide, silicon dioxide, and magnesium oxide, said components being present in the catalyst in the following quantities, in percent by weight:

iron oxides	85 – 52.6
aluminium oxide	12 – 45
calcium oxide	1.35 – 2
silicon dioxide	0.35 – 0.4
potassium oxide	0.5 – 0.6.

3,979,337

CATALYST FOR REDUCING NITROGEN OXIDES

Kazuhide Miyazaki, Tanashi, and Kiyomi Abe, Kokubunji, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Japan

Filed Mar. 21, 1974, Ser. No. 453,286
Claims priority, application Japan, June 15, 1973, 48-66972
Int. Cl.² B01J 21/04, 23/72, 23/74
U.S. Cl. 252—466 J 2 Claims

1. A catalyst prepared by impregnating a heatresistant carrier with a solution of an aliphatic monocarboxylate or an aliphatic tricarboxylate of the metals (1) iron, (2) at least one of nickel and cobalt and (3) copper, converting the thus impregnated monocarboxylate or tricarboxylates of said metals to the corresponding metal hydroxides with an alkaline solution and reducing said metal hydroxides with a reducing gas to the corresponding metals, said metals being contained in the ratio by weight of 60–40:20–30:20–30 respectively.

3,979,338

9-[9,12-EPOXY-ETHYL]-4-METHYL TRICYCLO[6.2.1.0^{2,7}]UNDEC-4-ENE AND 9-[9,12-EPOXY-ETHYL]-5-METHYL TRICYCLO[6.2.1.0^{2,7}]UNDEC-4-ENE ODOR-MODIFYING AGENTS

Erling Sundt, Pinchat-Geneva, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

Division of Ser. No. 528,669, Dec. 2, 1974, Pat. No. 3,953,534.
This application Dec. 2, 1975, Ser. No. 637,056
Claims priority, application Switzerland, Oct. 11, 1971, 14784/71; May 19, 1972, 7456/72
Int. Cl.² C11B 9/00
U.S. Cl. 252—522 1 Claim

1. A perfume composition comprising as one of its active ingredients at least one compound selected from the group consisting essentially of 9-[9,12-epoxy-ethyl]-4methyl-tricyclo[6.2.1.0^{2,7}]undec-4-ene and 9-[9,12-epoxy-ethyl]-5-methyl-tricylco[6.2.1.0^{2,7}]undec-4-ene in admixture with a suitable carrier.

3,979,339

HARD SURFACE CLEANING COMPOSITIONS

Gene W. Claybaugh, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 18, 1975, Ser. No. 559,460
Int. Cl.² C11D 3/37
U.S. Cl. 252—524 5 Claims

1. A method for removing soil from hard surfaces, the method comprising:

a. contacting a surface with an aqueous solution containing

1. from about 50 ppm to about 1000 ppm of a surfactant selected from the group consisting of anionic, nonionic, ampholytic, zwitterionic surfactants, and mixtures thereof;

2. from about 100 ppm to about 20,000 ppm of a builder selected from the group consisting of organic and inorganic builders and mixtures thereof;

3. from about 2 ppm to about 1000 ppm of a water soluble or dispersible nonionizing polymeric material selected from the group consisting of polyvinyl alcohols having a degree of hydrolysis of from about 60% to about 100% and a degree of polymerization of from about 100 to about 7000; and polyvinyl pyrrolidones having a degree of polymerization of from about 50 to about 6000; and mixtures thereof; and

b. oscillating the solution across the hard surface to remove the soil thereon.

3,979,340

OLEFIN SULFONATE DETERGENT COMPOSITIONS

Stephen Cajetan Klisch, Somerset, and Charles Andrew Martin, Morris Plains, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Apr. 9, 1973, Ser. No. 348,873
Int. Cl.² C11D 1/655
U.S. Cl. 252—548 4 Claims

1. A liquid detergent composition having reduced gelling tendency which consists essentially of 25 to 35% by weight of a mixture of the sodium salt of a sulfonated alpha olefin containing about 14 to 16 carbon atoms and an ammonium salt of an ethoxylated alcohol sulfate containing an alkyl group having an average of about 12 to 15 carbon atoms and from 1 to 5 ethenoxy groups, the weight ratio of olefin sulfonate to alcohol sulfate being about 1.1:1, and 1% to 10% by weight of a C_{12}–C_{14} alkanoic acid diethanolamide in 30% to 90% by weight of an aqueous medium containing from 1% to 10% by weight of ethanol, said composition containing at least 15 mole per cent of ammonium cations.

3,979,341

UREA FORMALDEHYDE FOAM

Marcel Widmann, West Hill, Canada, assignor to Borden Products Limited, West Hill, Canada

Filed May 28, 1974, Ser. No. 473,759
Int. Cl.² C08J 9/30; C08L 61/24
U.S. Cl. 260—2.5 F 10 Claims

5. A flame-retardant, intumescent foam which has thermal and sound insulating properties prepared from a mixture of (a) an aqueous urea-formaldehyde resin solution and (b) an aqueous foaming agent solution containing an acid curing agent, the resin solution comprising a condensation product of urea and formaldehyde in the ratio of 1.0 to 2.4 mols of formaldehyde per mol of urea; from 6.5 to 500 mmols of a foam charring agent selected from ethylene glycol and polyalkylene glycols containing from 2 to 8 carbon atoms in the alkylene moiety and having a molecular weight up to 200, glycerine, pentaerythrytol, sugars and mixtures thereof; from 0.3 to 1.2 mmols of a component to provide uniform cell size in the foam selected from water-soluble alkaline earth metal salts; from 3 to 310 mmols of a foam hydrolysis resistance component selected from dicyandiamide, guanylurea, calcium cyanamide, guanidine derivatives, hexamethylene tetramine; and from 2 to 30 mmols of a foam aging component selected from water-soluble alkali metal halogens.

3,979,342

MANUFACTURE OF VESICULATED POLYMER GRANULES

Andrejs Baidins, and Edward William Gillow, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del. Continuation-in-part of Ser. No. 382,175, July 24, 1973. This application Sept. 19, 1974, Ser. No. 507,550
Int. Cl.² C08J 9/28
U.S. Cl. 260—2.5 N 3 Claims

1. In a process for preparing vesiculated crosslinked polyester granules by polymerizing the oil phase of a water-in-oil-in-water emulsion formed from (a) a polymerizable water-immiscible oil phase composed of an ethylenically unsaturated monomer and a polyester obtained from the condensation of one or more polyhydric alcohols and one or more polycarboxylic acids, at least one of said alcohols or acids being unsaturated, (b) an aqueous phase, containing a base having a dissociation exponent of less than 8 in which said oil phase is dispersed to from a water-in-oil-in-water emulsion, and (c) distributed in at least one of said phases a free-radical polymerization initiator with or without a polymerization promoter,

wherein the improvement comprises effecting the polymerization of said oil phase essentially instantaneously and substantially immediately following the formation of said water-in-oil-in-water emulsion by

i. contacting said oil phase at a temperature from 10° to 40°C. with said aqueous phase at a temperature from 65° to 95°C.

said oil phase containing a free-radical polymerization initiator capable of activation at a temperature from 65° to 95°C. in the presence of water,

said aqueous phase containing in addition to said base at least one emulsion stabilizing agent selected from the group consisting of surface active agents and nonflocculating polymeric thickeners,

ii. recovering the product thereby formed as an aqueous slurry of said vesiculated cross-linked polyester granules.

3,979,343

SURFACE COATING COMPOSITIONS CONTAINING PIGMENT COATED WITH A POLYMERIC ORGANIC POLYOL

Thomas Graham, Clitheroe; Michael James Yates Foley, clayton-Le-Dale, near Blackburn, and David Reid, Blackburn, all of England, assignors to Reed International Limited, London, England

Filed Sept. 5, 1973, Ser. No. 394,493
Claims priority, application United Kingdom, Sept. 22, 1972, 44052/72
Int. Cl.² C09D 3/14, 3/20, 3/18
U.S. Cl. 260—16 13 Claims

1. A surface coating composition which comprises (a) a pigment coated with up to 5% by weight based on the weight of the pigment of a hydrophilic agent which is a polymeric organic polyol, (b) a binder composition comprising from 5% to 95% by weight of either an oil-modified alkyd resin having a hydroxyl value of from 90 to 270 or a polymerised fatty acid ester having a hydroxyl value of from 70 to 220 and from 95% to 5% by weight of an alkyd resin having a hydroxyl value below 60, and (c) a volatile substantially water-immiscible organic solvent, the proportions of the components (a), (b) and (c) being such that an applicator used to apply said coating composition may be readily cleaned in a dilute aqueous detergent solution.

3,979,344

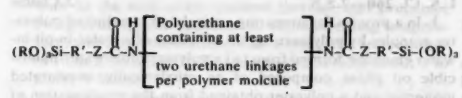
VULCANIZABLE SILICON TERMINATED POLYURETHANE POLYMER COMPOSITION HAVING IMPROVED CURE SPEED

Earle Ruskin Bryant, Adrian, Mich., and Joseph August Weis, Toledo, Ohio, assignors to Inmont Corporation, New York, N.Y.

Filed Nov. 19, 1974, Ser. No. 525,145
Int. Cl.² C08G *18/30*
U.S. Cl. 260—18 TN **13 Claims**

1. A sealant composition comprising a prepolymer which is a blend of:

a. a silicon terminated vulcanizable polyurethane polymer of the formula



wherein R is a lower alkyl radical of from 1 to 6 carbon atoms; wherein R′ is a divalent bridging radical selected from the groups consisting of a divalent hydrocarbon radical, a divalent hydrocarbon ether radical and a divalent hydrocarbon amino radical; and wherein Z is a member selected from the group consisting of —S and —NR″, where R″ is H or a lower alkyl radical of from 1 to 6 carbon atoms.

with

b. a small amount of N-beta aminoethyl, gamma aminopropyl trimethoxy silane.

3,979,345

FRIABLE COMPOSITION AND PROCESS

James E. Yates, Ponca City, Okla., and Wilfred M. Pinto, Mahtomedi, Minn., assignors to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 465,789, May 1, 1974, Pat. No. 3,883,363. This application Feb. 10, 1975, Ser. No. 548,960
Int. Cl.² C08L *93/00*
U.S. Cl. 260—23 XA **5 Claims**

1. In an improved process for the extrusion processing of a thermo plastic polymer for formulation using extrusion aids, the improvement comprising utilizing an extrusion aid prepared by mixing a paraffinic hydrocarbon wax and calcium salt of a fatty acid while heating to a temperature of at least 150°C and thereafter cooling to recover a solid, glass-like, friable composition, said paraffinic hydrocarbon wax having a drop melting point of at least 110°F, an oil content of not greater than 50 percent by weight and a needle penetration value at 77°F in the range of 1 mm to 20 mm, and said fatty acid being a $C_{16}-C_{24}$ aliphatic hydrocarbon monocarboxylic acid or mixtures thereof.

3,979,346

EMULSIFIERS FOR PREPARING AQUEOUS DISPERSIONS OF ALKYD RESINS

Bertram Zückert, and Wolfgang Schmut, both of Graz, Austria, assignors to Vianova-Kunstharz A.G., Vienna, Austria

Filed Oct. 31, 1974, Ser. No. 519,628
Int. Cl.² C08L *91/00*
U.S. Cl. 260—23 CP **27 Claims**

1. An alkyd resin dispersion dispersed in water containing 0.5 to 3 percent by weight of ammonia and as a dispersing aid, an emulsifier combination of (A) at least one non-ionic emulsifier, the hydrophobic part containing two or more radicals of a member of the group consisting of unsaturated fatty acids; unsaturated fatty alcohols, and mixtures thereof, with an iodine number of from about 130 to 200, and the hydrophilic part contains a member of the group consisting of polyethylene glycol chains, monomethoxypolyethylene glycol chains, and mixtures thereof, with 6 to 100 ethylene oxide units; and (B) at least one anionic emulsifier, the hydrophobic part containing two or more radicals of a member of the group consisting of unsaturated fatty acids; unsaturated fatty alcohols, and mixtures thereof, with an iodine number of from about 130 to 200, and the hydrophilic part contains carboxyl groups, at least 50 percent of said carboxyl groups being dissociated by the ammonia utilized, the amounts of and ratios of (A) and (B) being sufficient to disperse said alkyd resin in water and said ammonia.

3,979,347

LUBRICANT CONTAINING POLY(VINYL CHLORIDE) MOLDING COMPOSITION

Walter Brotz, Gersthofen, and Fred Mader, Nordendorf, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 370,240, June 15, 1973, abandoned, which is a continuation-in-part of Ser. No. 322,137, Jan. 9, 1973, abandoned. This application Sept. 3, 1974, Ser. No. 502,556
Int. Cl.² C08L *27/06, 91/06;* **D01F** *1/02*
U.S. Cl. 260—28.5 D **2 Claims**

1. A molding composition consisting of 100 parts by weight poly(vinyl chloride) and from 0.05 to 2.0 parts by weight as a lubricant of an oxidation product of polyethylene or a copolymer of ethylene and an α-olefin having from 3 to 8 carbon atoms, which polyethylene or ethylene and α-olefin copolymer have a molecular weight of 10,000 to 1,000,000, said oxidation product being prepared by treatment of a dispersion of said homopolymer or copolymer with oxygen or an oxygen-containing gas in the melt in the presence of a liquid dispersing agent inert to oxygen while constantly and thoroughly mixing the liquids under a pressure of from zero to 100 atomspheres gauge; said oxidation product having an acid number of from 30 to 150, a saponification number of from 40 to 220 and a dicarboxylic acid content of from 20 to 80 weight %.

3,979,348

IONIC POLYMERS FROM ACRYLAMIDE LATEX POLYMERS

Edward G. Ballweber, Glenwood, and Kenneth G. Phillips, River Forest, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 479,941, June 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 379,860, July 16, 1973, abandoned. This application Feb. 20, 1975, Ser. No. 551,467
Int. Cl.² C08L *61/20*
U.S. Cl. 260—29.4 UA **12 Claims**

1. A method for the preparation of a stable water in oil emulsion of finely divided, cationically modified acrylamide polymer which comprises the steps of:

A. Preparing an aqueous solution of formaldehyde and a secondary amine containing 2 to 8 carbon atoms with the molar ratio of formaldehyde to secondary amine containing 2 to 8 carbon atoms being from 10:1 to 1:10; to provide a formaldehyde secondary amine adduct and,

B. Adding the formaldehyde secondary amine adduct prepared in Step A to a water in oil emulsion of finely divided acrylamide polymer, said water in oil emulsion of a finely divided acrylamide polymer comprising in percentages by weight:

a. 10 to 50% acrylamide polymer,

b. 25 to 85% water,

c. 5 to 40% of a hydrophobic liquid, and

d. 0.1 to 21% of a water in oil emulsifying agent, said acrylamide polymer being characterized as having a molecular weight of from 10,000 to 25,000,000 and having a particle size of from 2 millimicrons up to about 5 microns, with the molar ratio of formaldehyde secondary amine adduct to acrylamide polymer of from 10:.1 to .1:10; and then,

C. Mixing the formaldehyde secondary amine adduct and said water in oil emulsion of finely divided acrylamide polymer for a period of time sufficient to produce a stable water in oil emulsion of a finely divided cationically modified acrylamide polymer.

3,979,349

DISPERSIONS OF WATER-SOLUBLE POLYMERS AND METHODS FOR MAKING AND USING THE SAME

Herbert Fink, Bickenbach; Horst Pennewiss, Darmstadt-Neu-Kranichstein; Hermann Plainer, Darmstadt; Hans Trabitzsch, Seeheim; Josef Frieser, Darmstadt-Weiterstadt, and Juergen Masanek, Pfungstadt, all of Germany, assignors to Rohm GmbH, Darmstadt, Germany

Filed May 1, 1974, Ser. No. 466,083

Claims priority, application Germany, May 7, 1973, 2322883

Int. Cl.² C08L *33/08*

U.S. Cl. 260—29.6 RW 12 Claims

1. A polymer dispersion comprising

A. 10 to 70 parts by weight of a continuous liquid organic phase, immiscible or only partially miscible with water, having dissolved therein from 2 to 28 percent, by weight of phase (A), of a water-in-oil dispersing agent which has an HLB-value below 6 at a pH above 4 and an HLB-value above 8 at a pH below 2, has a molecular weight above 10,000, and which is a copolymer of

1. 10 to 50 percent, by weight of said copolymer, of a vinyl or vinylidene monomer having a basic nitrogen atom, and

2. 90 to 50 percent, by weight of said copolymer, of

a. an acrylic acid ester or methacrylic acid ester of an alcohol having from 6 to 20 carbon atoms; or

b. a mixture of at least one monomer as in (a) with up to an equal amount by weight of at least one different water-insoluble vinyl or vinylidene monomer;

B. 90 to 30 parts by weight of an aqueous phase, finely-divided in phase (A), comprising

1. 5 to 75 percent, by weight of phase (B) of a water-soluble polymer dissolved in or swollen with

2. 95 to 25 percent, by weight of phase (B), of water; and

C. a water-soluble acid in an amount at least equivalent to the basic nitrogen atoms in (A)(1); said phases (A) and (B) together making up 100 parts by weight and having at most a small density difference.

3,979,350

α,β-UNSATURATED SCHIFF-BASE CHAIN EXTENSION REACTIONS FOR POLYIMIDES AND POLYAMIDE-IMIDES

Roland A. E. Winter, Armonk, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 26, 1973, Ser. No. 427,976

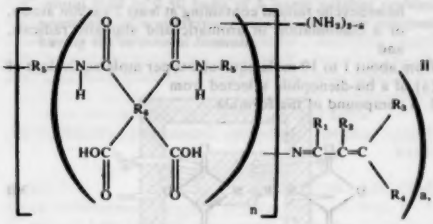
Int. Cl.² C08G *73/06*, *73/12*, *73/14*

U.S. Cl. 260—30.2 11 Claims

1. A composition of matter consisting essentially of

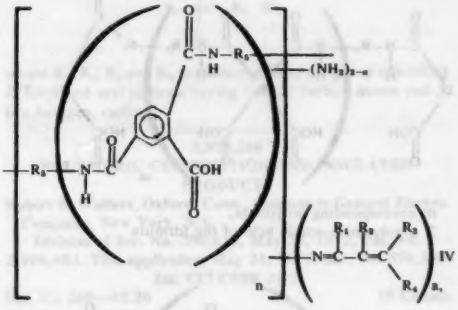
a. a prepolymer selected from

1. a polyamide-acid of the formula



its corresponding polyimide,

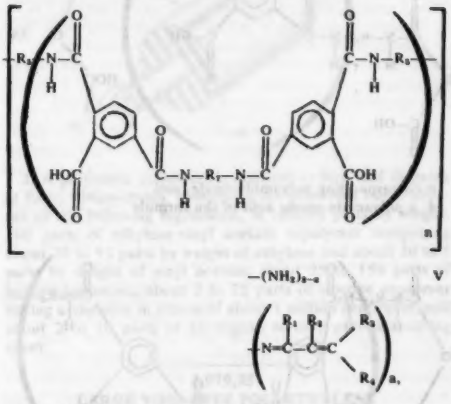
2. a polyamide-amide acid of the formula



IV

its corresponding polyamide-imide,

3. a polyamide-amide acid of the formula



V

and its corresponding polyamide-imide,

wherein

n is a number from 1 to 20,

a is a number from 0.1 to 2,

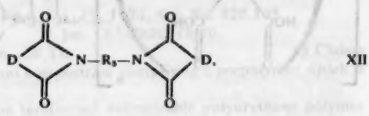
R_1, R_2, R_3 and R_4 are independently hydrogen or a monovalent aliphatic, cycloaliphatic, or aromatic radical and

R_5 and R_7 are independently a divalent organic radical containing from 2 to 30 carbon atoms and selected from aromatic, aliphatic, alkylaromatic, and cycloaliphatic radicals, and radicals with hetero-atom containing bridging groups where the heteroatom in the bridge is selected from oxygen, sulfur, nitrogen, phosphorus and silicon, and

R_6 is a tetravalent aliphatic, cycloaliphatic, aromatic or heterocyclic radical containing at least 2 carbon atoms, or a combination of aromatic and aliphatic radicals, and

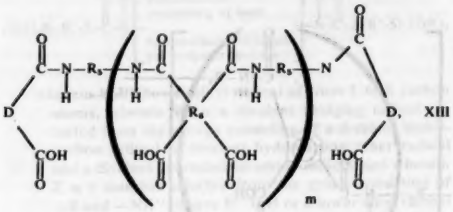
b. from about 1 to 10 mole equivalents per mole equivalent of (a) of a bis-dienophile selected from

1. a compound of the formula



XII

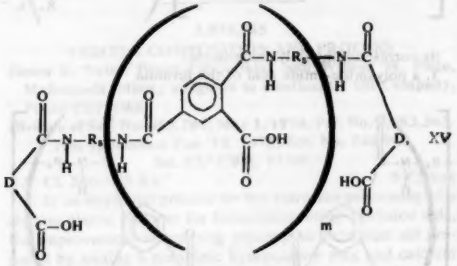
2. a polyamide-acid of the formula



XIII

its corresponding polyimide,

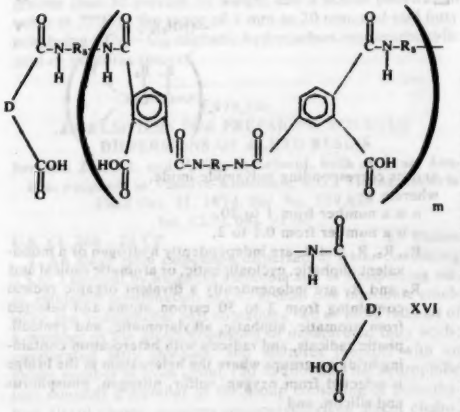
3. a polyamide-amide acid of the formula



XV

it corresponding polyamide-imide, and

4. a polyamide-amide acid of the formula



XVI

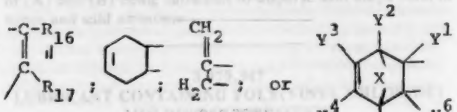
and its corresponding polyamide-imide,

wherein

R_5, R_6 and R_7 are as defined above,

m is a number from 1 to 20, and

D is a divalent radical containing olefinic unsaturation having the formula



wherein

R_{16} is hydrogen, methyl, bromo or chloro;

R_{17} is hydrogen, bromo or chloro;

Y^1–Y^6 inclusive is selected from hydrogen, bromine, chlorine, nitro, phenyl, alkyl of from 1 to 6 carbon atoms; and

X is carbonyl, oxygen, sulfur, chloro or bromo substituted methylene, alkylidene of from 1 to 6 carbon atoms, and benzylidene.

3,979,351

PROTECTIVE COATING MATERIAL

Jagdish S. Sekhon, Fountain Valley, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.

Continuation-in-part of Ser. No. 327,069, Jan. 26, 1973, abandoned. This application Sept. 19, 1973, Ser. No. 398,652

Int. Cl.² C08K *3/08, 3/30, 5/07*

U.S. Cl. 260—32.8 R **13 Claims**

1. A coating material comprising a mixture of: powdered metallic substance from the group consisting of aluminum and molybdenum disulfide, phenol-formaldehyde resin and metallic chromate in a carrier selected from the group consisting of lower alkyl alcohols, methyl ethyl ketone and petroleum distillate from the group consisting of xylene and toluene, and mixtures thereof, said material, upon application to a surface, drying to form a coating which is tough, adherent, smooth and corrosion resistant.

3,979,352

AQUEOUS BASE-SOLUBLE RESIN COMPOSITIONS

John W. Brady, Grand Island; Franklin D. Strickland, Buffalo, and Chester C. Longwith, Tonawanda, all of N.Y., assignors to Shanco Plastics & Chemicals Inc., Tonawanda, N.Y.

Filed July 30, 1973, Ser. No. 384,033

Int. Cl.² C08K *5/05;* **C08F** *220/06*

U.S. Cl. 260—33.4 R **9 Claims**

1. An aqueous base-soluble solid resin having an acid number of 120 to 185, which is the reaction product polymer of a reaction mix comprising about 20 to 70 mole percent of at least one carboxyl-free polymerizable ethylenically unsaturated monomer, about 15 to 60 mole percent of at least one carboxyl-substituted polymerizable ethylenically unsaturated monomer of the formula $CH_2{=}CR^2COOH$, wherein R^2 represents hydrogen or methyl, as a solvent for the reaction mixture, which is retained in the resin, a mixture of saturated alcohols of normal boiling points above about 175°C., which mixture contains about 30 to 60 weight percent of water insoluble liquid alcohol and about 40 to 70 weight percent of water soluble alcohol, the mole percentage of the solvent alcohols being about 10 to 20, and about 0.3 to 1 mole percent of an organic free radical-generating polymerization initiator, the number average molecular weight of the resin corresponding to about 600 to 4,000 at 10 mole percent content of sol-

vent in the reaction mix, and the water insoluble alcohol having a boiling point above 175°C. being a source of such alcohol in the resin.

3,979,353

DIAZONIUM SALT COMPOSITION FOR FORMING THERMOPARTICULATING COATING

James D. B. Smith, Turtle Creek, and David C. Phillips, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 15, 1975, Ser. No. 568,224
Int. Cl.² C08K 5/01; C08L 63/00; G01N 31/00
U.S. Cl. 260—33.6 EP 21 Claims

1. A composition comprising about 20 to about 250 phr of at least one diazonium salt solid and stable at 50°C and a solution of a resinous carrier curable and stable at 60°C and unreactive with said diazonium salt, where the amount of solvent in said solution is about 25 to about 75% (by weight based on said resinous carrier).

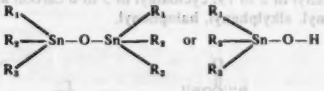
3,979,354

NON-POLLUTING, ANTIFOULING COMPOSITION AND METHOD

Edward J. Dyckman, Laurel; Jean A. Montemarano, Annapolis; Eugene C. Fischer, Arnold, and Robert R. Ressler, Annapolis, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 31, 1974, Ser. No. 438,313
Int. Cl.² C08G 51/04, 30/10
U.S. Cl. 260—37 EP 35 Claims

1. A nonpolluting, antifouling composition consisting essentially of a 1,2 epoxy polymer and a curing agent for the epoxy polymer, wherein said curing agent comprises an active hydrogen containing compound capable of crosslinking the epoxy polymer, said compound having as a substituent a carboxylic acid group which is chemically bonded to an organo-tin compound selected from the group consisting of tin oxides and tin hydroxides of the formula:



wherein R_1, R_2 and R_3 are selected from the group consisting of propyl, butyl, phenyl and benzyl, and R_1, R_2 and R_3 are the same or different, and wherein said curing agent acts to crosslink the epoxy polymer.

3,979,355

ARSONIUM LATENT CATALYSTS FOR CURING EPOXY RESINS

James D. B. Smith, Turtle Creek, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

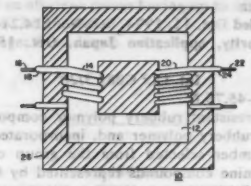
Filed Feb. 13, 1974, Ser. No. 442,266
Int. Cl.² C08G 51/04
U.S. Cl. 260—37 EP 23 Claims

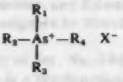
1. A resinous composition suitable for insulating electrical members, comprising by weight:

A. about 100 parts of an epoxy resin containing more than one 1,2 epoxy group per molecule,

B. about 55 to 165 parts of an organic acid anhydride selected from the group consisting of monofunctional anhydrides and polyfunctional anhydrides effective as a curing agent for epoxy resins, and

C. about 0.04 to 0.50 parts of a latent catalyst consisting essentially of a quaternary organic arsonium compound having the structural formula:





where R_1, R_2, R_3 and R_4 are selected from the group consisting of alkyl and aryl radicals having 1 to 21 carbon atoms and X is a halogen, radical.

3,979,356

POLYMERIC COMPOSITION AND INSULATED PRODUCTS

Robert B. Walters, Oxford, Conn., assignor to General Electric Company, New York, N.Y.

Division of Ser. No. 390,618, May 30, 1972, Pat. No. 3,900,681. This application May 21, 1975, Ser. No. 579,389
Int. Cl.² C08K 3/12
U.S. Cl. 260—42.26 15 Claims

1. A polymeric composition resistant to flow and dripping at flame temperatures, comprising the cross-link cured product of the following ingredients, in relative parts by weight: 100 parts of ethylene-vinyl acetate copolymer comprising about 70 to 95 parts by weight of ethylene and about 30 to 5 parts by weight of vinyl acetate; about 25 to 150 parts of hydrated alumina; about 2 to 25 parts of silicone elastomer having a viscosity in excess of about 1 million centipoise; and about 2 to 10 parts of an organo tertiary peroxide curing agent.

3,979,357

LARGE VOID-FREE POLYETHYLENE

Ival O. Salyer, Dayton, and Charles J. North, West Carrollton, both of Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.

Division of Ser. No. 425,894, Dec. 13, 1973, Pat. No. 3,929,939, which is a continuation of Ser. No. 219,498, Jan. 20, 1972, abandoned. This application Apr. 4, 1975, Ser. No. 565,165
Int. Cl.² C08K 3/38
U.S. Cl. 260—42.46 1 Claim

1. A composite material which comprises 50 to 75 weight percent high density polyethylene pellets having a size range of about 1/16 inch to ¼ inch in a matrix of 25 to 50 weight percent low density polyethylene, and which further comprises from 1 to 10 weight percent boron.

3,979,358

HEAT RESISTANT RUBBERY POLYMER COMPOSITION

Shiyuji Nishibata, Hisai; Kazumasa Hirose, Yokkaichi; Kunihara Harada, Yokohama, and Tokuro Fukumori, Mie, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

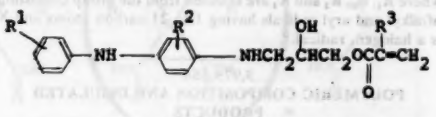
Filed Oct. 11, 1974, Ser. No. 514,214

Claims priority, application Japan, Oct. 15, 1973, 48-115518

Int. Cl.² C08J 3/20

U.S. Cl. 260—45.75 N 7 Claims

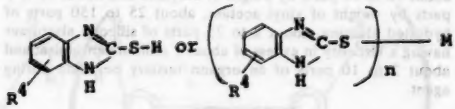
1. A heat resistant rubbery polymer composition which comprises a rubbery polymer and, incorporated therein, at least one member selected from the group consisting of phenylenediamine compounds represented by the following general formula (I)



(I)

wherein R^1 and R^2 stand for a hydrogen, fluorine, chlorine or bromine atom or a hydrocarbon residue having 1 to 12 carbon atoms, and R^3 stands for a hydrogen atom or a hydrocarbon residue having 1 to 4 carbon atoms,

and at least one member selected from the group consisting of mercaptobenzo-1,3-diazole and mercaptobenzo-1,3-diazole salts represented by the following general formula (II)



(II)

wherein R^4 stands for a hydrogen, fluorine, chlorine or bromine atom or a hydrocarbon residue having 1 to 12 carbon atoms, M is a metal of the group II or VIII of the Periodic Table, and n is 2 or 3, compounds I and II each being present in an amount effective to prevent degradation of the rubbery polymer.

3,979,359

CARBOFUNCTIONAL SULFUR AND CARBOXYLATE BRIDGED TIN COMPOUNDS

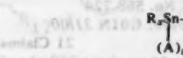
Thomas G. Kugele, and Arthur F. Koeniger, both of Cincinnati, Ohio, assignors to Cincinnati Milacron Chemicals, Inc., Reading, Ohio

Filed Nov. 15, 1974, Ser. No. 524,271

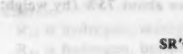
Int. Cl.² C08J 3/20

U.S. Cl. 260—45.75 S 55 Claims

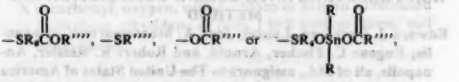
1. A sulfur containing organotin compound having the formula (1):



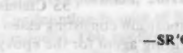
where R is a monovalent alkyl radical of 1 to 8 carbon atoms, A is



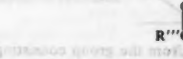
halogen of atomic weight 35 to 127,



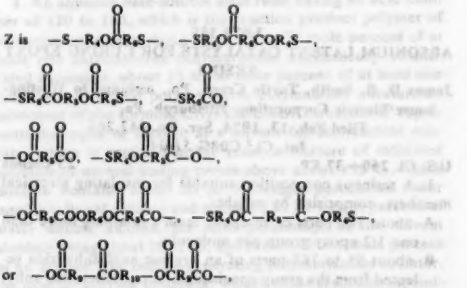
the A groups are the same or different, with the proviso that at least one

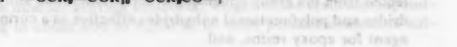


is in the molecule, d is 0 or 1, each R′ when d is 0 is alkylene of 1 to 10 carbon atoms; each R′ when d is 1 is alkylene of 2 to 10 carbon atoms, each R″ is hydrogen, alkyl of 1 to 20 carbon atoms, ethylenically unsaturated aliphatic hydrocarbyl having 1 to 3 ethylenic double bonds and 2 to 19 carbon atoms, halo or hydroxy alkyl of 2 to 19 carbon atoms, halo or hydroxy alkenyl of 2 to 19, cycloalkyl of 5 to 6 carbon atoms, benzyl, phenyl, alkylphenyl, halophenyl,

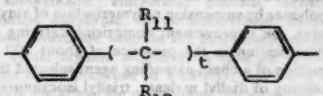


where R‴ is alkylene of 2 to 10 carbon atoms, R⁗ is alkyl of 1 to 20 carbon atoms, alkenyl of 2 to 18 carbon atoms, halo or hydroxy alkyl of 2 to 20 carbon atoms, halo or hydroxy alkenyl of 2 to 20 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, benzyl, phenyl or halophenyl, x is 1 or 2, y is 1 or 2 and z is 1 or 2, the total of $x+y+z$ is 4,

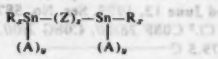
Z is 

or 

where R_4 is arylene, —CH=CH—, alkylene of 2 to 10 carbon atoms, R_5 is nothing, alkylene of 1 to 8 carbon atoms, phenylene or —CH=CH—, R_6 is alkylene of 1 to 10 carbon atoms, —CH=CH— or arylene, R_9 is a residue of a dicarboxylic acid from which the two carboxyl groups have been removed, R_{10} is arylene or



where t is 0 to 1
and R_{11} and R_{12} are H or alkyl, or (2) an overbased compound prepared by reacting a dialkyltin oxide of alkylstannoic acid with a compound of the formula:



54. A halogen-containing polymer composition containing a compound according to claim 1 in an amount effective to heat stabilize the polymer.

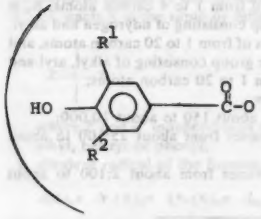
3,979,360

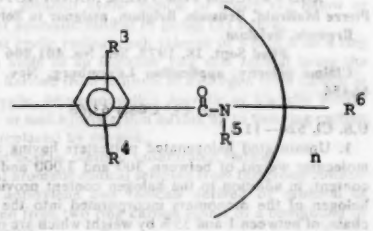
COMPOSITIONS STABILIZED WITH BENZOYLOXYBENZAMIDES

John D. Spivack, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 318,325, Dec. 26, 1972, Pat. No. 3,880,910. This application Feb. 24, 1975, Ser. No. 552,479
Int. Cl.² C08J *3/20*
U.S. Cl. 260—45.85 B **15 Claims**

1. A composition of matter stabilized against degradation which comprises an organic material subject to oxidative and ultraviolet light degradation containing from about 0.01 to about 5.% by weight of a stabilizing compound of the formula





wherein
R^1 and R^2 are (lower)alkyl or (lower)cycloalkyl groups,
R^3, R^4 and R^5 are independently hydrogen, (lower)alkyl or (lower)cycloalkyl,
R^6 is an alkyl group having up to 24 carbon atoms when n is 1 and an alkylene group having up to 10 carbon atoms when n is 2 to 6, and
n is an integer from 1 to 6.

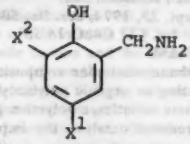
3,979,361

2-AMINOMETHYL-6-TRIHALO-METHYLPHENOLS

Everett M. Schultz, Ambler, and Edward J. Cragoe, Jr., Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 444,200, Feb. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 120,730, March 3, 1971, Pat. No. 3,794,734. This application Aug. 1, 1975, Ser. No. 600,990
Int. Cl.² C07C *87/28*
U.S. Cl. 260—570.9 **2 Claims**

1. A compound of the formula:



wherein X^1 is C_{1-7} lower alkyl or cycloalkyl containing 5 to 6 carbon atoms; and X^2 is trifluoromethyl; or the nontoxic pharmaceutically acceptable salts thereof.

3,979,362

PROCESS FOR THE PRODUCTION OF SILICO-AMINO COMPOUNDS AND THEIR CONDENSATION PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 71,628, Sept. 11, 1970, abandoned. This application Mar. 17, 1975, Ser. No. 559,313
Int. Cl.² C08G *12/26;* **C08K** *3/34;* **C08G** *12/04, 12/08*
U.S. Cl. 260—67.6 R **6 Claims**

1. The process for the production of silico-amino resinous condensation products by the following steps:
a. mixing silico-formic acid with an amino compound selected from the group consisting of urea, thiourea, melamine, aniline, guanidine, saccharin, propyl urea, butyl urea, benzene and toluene sulfonamides, ammeline, dicyandiamide, aliphatic diamines, other alkyl-substituted ureas and mixtures thereof in a ratio of 0.5 to 2 mols of silico-formic acid to one mol of the amino compound;
b. adding an aldehyde selected from the group consisting of an aqueous solution of formaldehyde, formaldehyde, acetaldehyde, butyraldehyde, chloral, acrolein, furfural, hexamethylene tetramine and mixtures thereof in a ratio of 1 to 3 mols to one mol of amino compound;
c. adjusting the pH to a pH of 4 to 5 with an acid catalyst selected from the group consisting of sulfuric acid, hydrochloric acid, formic acid, acetic acid, tartaric acid, oxalic acid, aromatic sulfonic acid, acid salts, acid esters such as acid alkyl phosphates and mixtures thereof;
d. heating said mixture to 60° to 100°C while agitating for 20 to 40 minutes; thereby
e. producing a silico-amino resinous condensation product.

3,979,363

METHOD OF PRODUCING POLYURETHANE FILAMENTS

Wiprecht Eberius, Elsenfeld; Gerhard Wick, Obernburg; Heinz Grotjahn, Rollfeld, and Eckart Jacobs, Obernburg, all of Germany, assignors to Akzo N.V., Arnhem, Netherlands

Filed Nov. 7, 1973, Ser. No. 413,552

Claims priority, application Germany, Nov. 18, 1972, 2256664

Int. Cl.² C08F 18/24; D01F 6/00

U.S. Cl. 260—77.5 AT 23 Claims

1. A method of producing a filamentary polyurethane of improved chemical resistance and physical properties which comprises:

preforming an elastomeric filamentary polyurethane which contains at least about 100 up to about 700 milliequivalents/kg. of terminal primary or secondary amino groups or a mixture thereof; and

treating the preformed filamentary polyurethane with an organic polyisocyanate.

3,979,364

POLYURETHANE ELASTOMERS HAVING IMPROVED SAG RESISTANCE

Richard Lee Rowton, Austin, Tex., assignor to Jefferson Chemical Company, Inc., Houston, Tex.

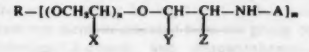
Filed Sept. 23, 1974, Ser. No. 508,455

Int. Cl.³ C08G 18/38

U.S. Cl. 260—77.5 AM 13 Claims

1. In a polyurethane elastomer composition prepared by admixing and reacting an organic polyisocyanate compound having free isocyanate moieties, a polyether polyol compound and a selected urethane catalyst, the improvement which comprises:

adding to said admixture from about 1 to about 50 equivalents per 100 equivalents of said polyether polyol of a polyoxyalkylene polyamine of the formula:



wherein R is the nucleus of an oxyalkylation-susceptible saturated polyhydric alcohol containing 2 to 12 carbon atoms and 2 to 8 hydroxyl groups and R consists of hydrogen and carbon, Z is an alkyl group containing 1 to 18 carbon atoms, X and Y independently are hydrogen or Z, A is cyano-loweralkyl of 1 to 2 carbon atoms or hydrogen, n has an average value of 0 to 50 and m is an integer of 2 to 8 corresponding to the number of hydroxyl groups originally present in the polyhydric alcohol.

3,979,365

PROCESS FOR PRODUCING THERMOSETTING RESINS

Goro Tanaka; Shinichi Toyoda, and Toshikazu Narahara, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 28, 1974, Ser. No. 501,363

Claims priority, application Japan, Aug. 31, 1973, 48-97142

Int. Cl.² C08G 18/00, 18/18, 18/20, 18/22

U.S. Cl. 260—77.5 NC 19 Claims

1. A process for producing a thermosetting resin which comprises blending 1 equivalent of a polyoxazolidone prepolymer terminated by two vicinal epoxy groups and containing at least two oxazolidone rings with at least 1 equivalent of a polyfunctional isocyanate compound, adding 0.01 to 10% by weight of a catalyst which forms isocyanurate rings and oxazolidone rings based on the total amount of the polyoxazolidone prepolymer and the isocyanate compound, and then heating to polymerize the resultant composition by forming isocyanurate rings and oxazolidone rings.

3,979,366

VINYL CHLORIDE SUSPENSION POLYMERIZATION

Peter A. Schwab, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed June 12, 1975, Ser. No. 586,474

Int. Cl.² C08F 218/14; C08G 63/00; C08F 214/00, 114/02

U.S. Cl. 526—345 3 Claims

1. An improved method for the production polyvinyl chloride homopolymer by suspension polymerization of vinyl chloride monomer, the improvement comprising carrying out the entire polymerization in the presence of about 300 to 500 parts per million of a chain-extending agent selected from the group consisting of diallyl maleate, triallyl isocyanurate, and diallyl phthalate while using elevated temperatures and reduced polymerization times.

3,979,367

POLYKETONE DERIVATIVE

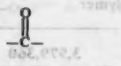
Thomas E. Klovsky, and Richard C. Kromer, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed June 13, 1975, Ser. No. 587,199

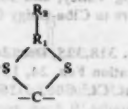
Int. Cl.² C08F 28/00; C08G 2/00, 4/00

U.S. Cl. 260—79.5 C 7 Claims

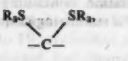
1. The thermoplastic polymer characterized by random distribution along the polymer chain of x units of



y units of $-CH_2-CH_2-$ and z units of



or



where

a. R_1 is an alkyl group of from 1 to 4 carbon atoms, R_2 is selected from the group consisting of hdyrogen and alkyl, aryl and alkenyl groups of from 1 to 20 carbon atoms, and R_3 is selected from the group consisting of alkyl, aryl and alkenyl groups of from 1 to 20 carbon atoms;

b. x, y and z are integers;

c. y has a value of from about 150 to about 10,000;

d. the ratio of x to y varies from about 25:100 to about 100:100; and

e. the ratio of z to x varies from about 2:100 to about 25:100.

3,979,368

SUPER-HALOGENATED UNSATURATED POLYESTERS AND PROCESS FOR THEIR MANUFACTURE

Pierre Malfroid, Brussels, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Filed Sept. 28, 1973, Ser. No. 401,806

Claims priority, application Luxemburg, Nov. 10, 1972, 66454

Int. Cl.² C08G 63/68

U.S. Cl. 526—11.2 8 Claims

1. Unsaturated halogenated polyesters having an average molecular weight of between 300 and 3,000 and a halogen content, in addition to the halogen content provided by the halogen of the monomers incorporated into the polymeric chain, of between 1 and 35% by weight which are obtained by

copolymerizing (1) an α-epihalohydrin selected from the group consisting of epichlorohydrin, epibromohydrin and their mixtures with (2) an organic anhydride selected from the group consisting of maleic anhydride and mixtures thereof with another cyclic organic anhydride selected from the group consisting of succinic anhydride, glutoric anhydride, citraconic anhydride, itaconic anhydride, tetrahydrophthalic anhydride, methylnadic anhydride, phthalic anhydride, dichloromaleic anhydride, tetrabromophthalic anhydride and chlorendic anhydride wherein not more than one mol of said another cyclic organic anhydride is used per mol of maleic anhydride in the presence of a catalyst consisting essentially of titanium tetrachloride or titanium tetrabromide, the molar ratio of the α-epihalohydrin and the organic anhydride being between 1:1 and 2:1 and the molar ratio of the titanium tetrachloride or titanium tetrabromide and the sum of epihalohydrin and organic anhydride being between 0.001 and 0.1.

3,979,369

METHOD FOR CROSS-LINKING RUBBER WITH POLYSULFIDES

Chester Draper Trivette, Jr., Akron, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 200,595, Nov. 19, 1971, Pat. No. 3,869,435. This application Sept. 20, 1974, Ser. No. 507,763

Int. Cl.² C08C *11/60, 11/54, 11/66;* **C08D** *9/00*

U.S. Cl. 260—79.5 C **42 Claims**

1. The method of cross-linking which comprises incorporating into diene rubber a cross-linking amount of

$$(AccS\text{-}S_x)_nR\text{-}S_x\text{-}SAcc$$

where AccS is the same or different accelerating moiety, x is 1, 2, 3 or 4, n is 1, 2 or 3 and R is an organic radical of 1 to 24 carbon atoms of valence $n + 1$ selected from the group consisting of

a. divalent radical of the formula $(X)_{n'}$ where n' is 1 to 24, each X is the same or different and is

where Z and Z' independently are hydrogen, alkyl, cycloalkyl, benzyl or phenyl,

b. divalent radical of the formula

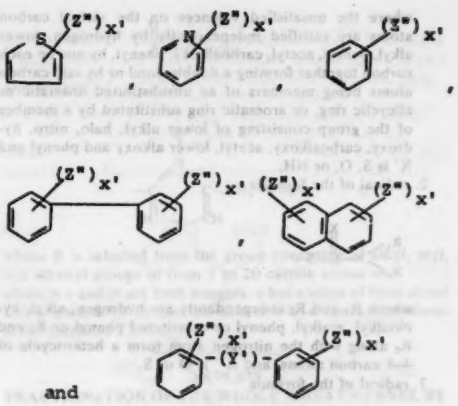
$$\text{-}(X)_{n''}\text{-}Y\text{-}(X)_{n''}\text{-}[Y\text{-}(X)_{n''}\text{-}]_m$$

where each n'' independently is 1 to 23, m is zero, 1 or 2, X has the same meaning as before and Y is oxygen, sulfur, $-SO_2-$, HN<, C_5H_9N<, lower alkyl-N<, —C(O)O—, divalent cyclic radical of group (c) below or divalent aromatic radical of group (e) below,

c. divalent cyclic radical each valence of which is on a ring carbon atom of an aliphatic ring said radical being the radical derived from removal of hydrogen from carbon in monocyclic, bi(monocyclic), bicyclic or tricyclic hydrocarbon or said hydrocarbon having up to two ring carbon atoms replaced by oxygen,

d. divalent acyclic olefinic unsaturated radical,

e. divalent aromatic radical selected from the group consisting of anthrylene and radicals derived by removal of hydrogen from two ring carbon atoms of a compound of the formula



where each Z'' independently is hydrogen, lower alkyl, hydroxy, lower alkoxy, acetyl, phenyl, chloro or nitro, Y' is oxygen, sulfur, $-SO_2-$, —CO—, lower alkylene or lower alkylidene and x' is 1 to 4,

f. combination of the formula -T-T'- where one valence is linked to cyclic carbon and the other to acyclic carbon, T being selected from the group consisting of (a), (b), (c), (d) and (e) and T' being selected from a different member of the same group,

g. straight and branched chain alkylene substituted by one or more radicals selected from the group consisting of oxo, hydroxy, alkoxy, hydroxysubstituted alkoxy, alkoxy-substituted alkoxy, carboxy, carboxy substituted alkoxy, carboalkoxy and acyloxy,

h. trivalent radical selected from the group consisting of radical derived by removal of one hydrogen from a radical of group (a), (b), (c), (d), (e), (f) or (g), radical of the formula

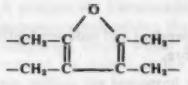
$$-A'-OCH_2CH(OA'-)CH_2OA'-$$

where A' is lower alkylene and radical of the formula

$$A\text{-}C(A'OOCA'\text{-})_3$$

where A is lower alkyl and A' independently is lower alkylene,

i. tetravalent radical selected from the group consisting of a radical derived by removal of two hydrogen atoms from a radical of group (a), (b), (c), (d), (e), (f) or (g), radical of the formula

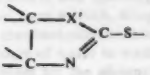


and radical of the formula

$$C(A'OOCA'-)_4$$

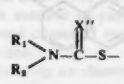
where A' is independently lower alkylene; and the accelerating moiety is selected from the group consisting of

1. radical of the formula



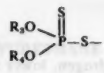
where the unsatisfied valences on the vicinal carbon atoms are satisfied independently by hydrogen, lower alkyl, benzyl, acetyl, carboalkoxy, phenyl, by one on each carbon together forming a double bond or by said carbon atoms being members of an unsubstituted aromatic or alicyclic ring, or aromatic ring substituted by a member of the group consisting of lower alkyl, halo, nitro, hydroxy, carboalkoxy, acetyl, lower alkoxy and phenyl and X′ is S, O, or NH,

2. radical of the formula



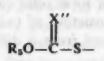
where R_1 and R_2 independently are hydrogen, alkyl, cycloalkyl, aralkyl, phenyl or substituted phenyl or R_1 and R_2 along with the nitrogen atom form a heterocycle of 4–8 carbon atoms, and X″ is O or S,

3. radical of the formula



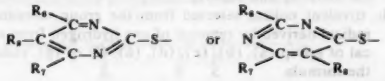
where R_3 and R_4 independently are alkyl, cycloalkyl, aralkyl, phenyl or alkyl substituted phenyl,

4. radical of the formula



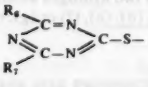
where R_5 is alkyl, cycloalkyl, aralkyl, phenyl and substituted phenyl and X″ is O or S,

5. radical of the formula



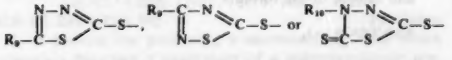
where R_6, R_7 and R_8 independently are hydrogen, lower alkyl, lower alkoxy, phenyl, nitro, chloro, lower alkylthio, lower alkylamino, lower dialkylamino, lower dialkenylamino, heterocyclic amino or R_7 and R_8 along with the adjacent carbon atoms to which they are attached form ortho arylene; and the corresponding dihydro and tetrahydro radicals,

6. radical of the formula



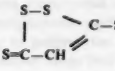
where R_6 and R_7 are independent and independently have the same meaning as before,

7. radical of the formula

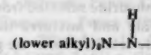


where R_9 is acetamido, lower alkyl, phenyl, chloro or bromo, and R_{10} is lower alkyl or phenyl,

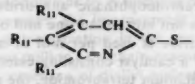
8. radical of the formula



9. radical of the formula

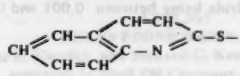


10. radical of the formula



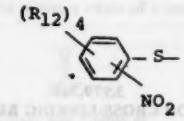
where each R_{11} independently is hydrogen or lower alkyl,

11. radical of the formula



and

12. radical of the formula



where independently each R_{12} is hydrogen, alkyl, chloro, nitro, carboalkoxy, carboxy or acetyl; with the proviso that when the accelerating moiety is selected from the group consisting of (1), (5), (6), (7), (8), (10) and (11) R cannot be (b) and when the accelerating moiety is (1), (3) or (12) each Acc is different, and effecting cross-linking of the rubber.

3,979,370

METHOD FOR SIMULTANEOUS ADDITION OF NON-COMPATIBLE SUBSTANCES TO A MIXING ZONE

Edwin F. Peters, Winfield, and James L. Jezl, St. Charles, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 16, 1975, Ser. No. 568,599
Int. Cl.² C08J *3/00, 3/20;* **C08F** *10/02, 10/06*
U.S. Cl. 526—348 **7 Claims**

1. A method for introducing a plurality of non-compatible substances comprising water, a liquid hydrocarbon and polymer additives into a molten polymer following catalytic polymerization comprising:

a. forming a stable dispersion in which the non-compatible substances are incorporated; and

b. injecting the dispersion into the polymer melt with mixing.

3,979,371

POLYMERIC LIMONENE EPOXIDE AND PROCESS FOR PREPARING THE SAME

Erwin Richard Ruckel, Darien, Conn., assignor to Arizona Chemical Company, Wayne, N.J.

Filed Jan. 24, 1975, Ser. No. 543,761
Int. Cl.² C08F *124/00*
U.S. Cl. 526—273 **6 Claims**

1. A process for the preparation of a homopolymer which comprises the steps of: contacting monomeric limonene 1,2-mono epoxide dissolved in an inert polar solvent at a temperature ranging between −20°C. and −150°C. in the presence of

an inorganic, non-metallic Lewis acid, fluoride catalyst, and thereafter recovering resultant polymer.

3,979,372

PREPARATION OF TITANIUM TRICHLORIDE POLYMERIZATION CATALYST COMPONENT

Herman Th. van der Bend, and Willem Sjardijn, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 30, 1974, Ser. No. 537,519

Claims priority, application United Kingdom, Jan. 3, 1974, 278/74

Int. Cl.² C08F 4/64, 110/06; B01J 31/02; C01G 23/02

U.S. Cl. 526—351 **7 Claims**

1. In the process for the preparation of gamma-activated $TiCl_3$, useful as a catalyst component in the stereoregular polymerization of alpha-monoolefins, which comprises the reduction of $TiCl_4$ to a beta-$TiCl_3$ composition by reaction with trialkylaluminum compound or a dialkyl-aluminum hydride at a temperature between −110° and −50°C and heating the so-produced $TiCl_3$ at a temperature in the range from above 80°C to 225°C for a sufficient time to substantially convert said beta to gamma-$TiCl_3$; the improvement which comprises washing the $TiCl_3$ composition with an aliphatic hydrocarbon and separating the washed $TiCl_3$ from the hydrocarbon, both the washing and separation being carried out at a temperature in the range from 40° to 200°C, and repeating the washing and separation until the hydrocarbon separated from the $TiCl_3$ is substantially free from dissolved aluminum compounds, wherein said heating may be conducted in the course of said washing treatment.

3,979,373

POLYMERIC FURAN DERIVATIVE

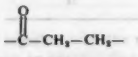
Thomas E. Kiovsky, and Richard C. Kromer, both of Houston, Tex., Assignors to Shell Oil Company, Houston, Tex.

Filed June 13, 1975, Ser. No. 587,001

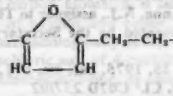
Int. Cl.² C08F 110/02; C08G 2/00, 4/00

U.S. Cl. 526—12 **7 Claims**

1. The thermoplastic polymer characterized by random distribution along the polymer chain of *n* units of



and *m* units of



wherein *n* and *m* are both integers, *n* has a value of from about 150 to about 10,000, and the ratio of *m* to *n* varies from about 2:100 to about 25:100.

3,979,374

POLYMERIC PYRROLLIC DERIVATIVE

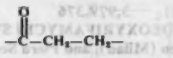
Thomas E. Kiovsky, and Richard C. Kromer, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed June 13, 1975, Ser. No. 587,198

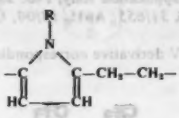
Int. Cl.² C08F 110/02; C08G 4/00, 12/00

U.S. Cl. 526—12 **10 Claims**

1. The thermoplastic polymer characterized by random distribution along the polymer chain of *n* units of



and *m* units of



where R is selected from the group consisting of alkyl, aryl, and alkenyl groups of from 1 to 20 carbon atoms and wherein *n* and *m* are both integers, *n* has a value of from about 150 to about 10,000, and the ratio of *m* to *n* varies from about 2:100 to about 25:100.

3,979,375

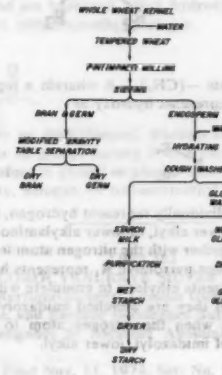
FRACTIONATION OF THE WHOLE WHEAT KERNEL BY PIN MILLING

Ganta V. Rao; Wayne E. Henry, and David L. Hammond, all of Hutchinson, Kans., assignors to Far-Mar-Co., Inc., Hutchinson, Kans.

Filed May 7, 1974, Ser. No. 467,803

Int. Cl.² A23J 1/12

U.S. Cl. 260—112 G **15 Claims**



1. A process for fractionating the whole wheat kernel into its components comprising the steps of:

a. tempering whole wheat kernels in water to a moisture content, by weight, in the range from 14 to 22%;

b. pin milling the tempered whole wheat kernels into bran, germ and endosperm particles, said bran and germ particles being larger than said endosperm particles;

c. separating the bran and germ particles from the endosperm particles;

d. hydrating said separated endosperm particles in an additional quantity of water ranging from 65 to 75% by weight of said endosperm particles to be hydrated and in an amount just sufficient to achieve a saturation moisture content and agitating the endosperm particles and water to form a thick, dough-like mass; and

e. mechanically working the dough-like mass in the presence of water to wash the non-gluten endosperm components for the gluten.

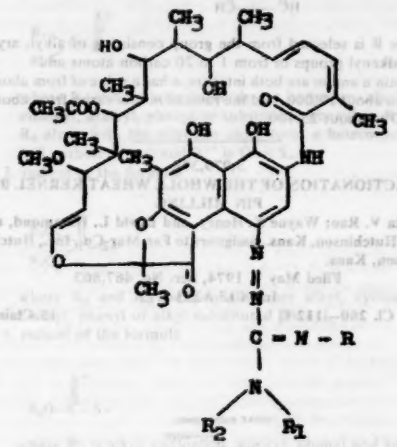
3,979,376

4-GUANYLAZO-4-DEOXYRIFAMYCIN SV DERIVATIVES

Nicola Maggi, Cusano (Milan), and Piero Sensi, Milan, both of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Filed Feb. 18, 1971, Ser. No. 116,601
Claims priority, application Italy, Feb. 23, 1970, 20973/70
Int. Cl.[2] A61K *31/655*; A61L *13/00*; C07C *107/04*
U.S. Cl. 260—152 9 Claims

1. A rifamycin SV derivative corresponding to the formula:



wherein R represents $-(CH_2)_n-$A wherein *n* represents the integer 2 or 3, A represents hydroxy or

where R_3 and R_4 individually represent hydrogen, lower alkyl, lower alkylamino-lower alkyl, di-lower alkylamino-lower alkyl or cyclohexyl or together with the nitrogen atom to which they are attached represent pyrrolidyl; R_1 represents hydrogen or, taken with R, represents ethylene to complete with the nitrogen atoms to which they are attached imidazolyl; R_2 represents hydrogen or, when the nitrogen atom to which it is attached is a part of imidazolyl, lower alkyl.

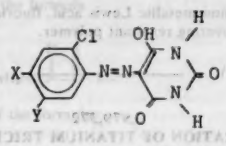
3,979,377

YELLOW AZO PIGMENT AND PROCESS OF PREPARATION FROM DICHLOROANILINE AND BARBITURIC ACID

Edward Ephraim Jaffe, Union, N.J.; William Joseph Marshall, Wilmington, Del., and Ernest Anton Stefancsik, Flemington;, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 8, 1974, Ser. No. 495,804
Int. Cl.[2] C09B *62/24*, *29/36*
U.S. Cl. 260—154 4 Claims

1. A yellow azo pigment of the formula



where X is selected from the group consisting of hydrogen and chlorine, Y is selected from the group consisting of hydrogen and chlorine and only one of X and Y can be hydrogen.

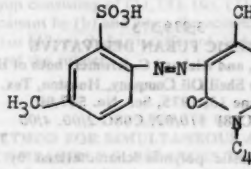
3,979,378

WATER-SOLUBLE AZO DYES HAVING A SUBSTITUTED 2-HYDROXYPYRIDONE (6) COUPLING COMPONENT

Gerhard Gnad; Günther Lamm, and Johannes Dehnert, all of Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 27, 1971, Ser. No. 110,249
Claims priority, application Germany, Jan. 31, 1970, 2004487
Int. Cl.[2] C09B *29/36*; D06P *3/24*
U.S. Cl. 260—156 2 Claims

1. The compound of the formula



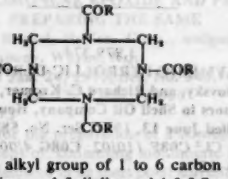
3,979,379

PROCESS FOR PRODUCING 1,3,5,7-TETRAALKANOYL-1,3,5,7-OCTAHYDROTETRAZOCINES

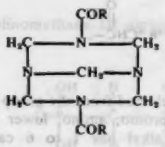
Victor I. Siele, Succasunna, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 25, 1975, Ser. No. 571,877
Int. Cl.[2] C07D *257/02*
U.S. Cl. 260—239 BC 8 Claims

1. In the process for producing a 1,3,5,7-tetraalkanoyl-1,3,5,7-octahydrotetrazocine of the formula



wherein R is an alkyl group of 1 to 6 carbon atoms, which comprises reacting a 1,5-dialkanoyl-1,3,5,7-tetraazabicyclo (3,3,1) nonane of the formula



wherein R in both cases is the same and has the foregoing definition, with an alkanoyl chloride and an alkanoic acid anhydride of the formulas, resp.

RCOCl and $(RCO)_2O$

wherein R in both cases is the same and has the foregoing definition, in the presence of an organic diluent, wherein the improvement comprises carrying out said reaction in the presence of an alkanoic acid salt of the formula RCOOMe, wherein R has the foregoing definition and Me is an alkali metal.

3,979,380

DERIVATIVES OF IMIDAZOLIDIN-2-ONES AND -2-THIONES

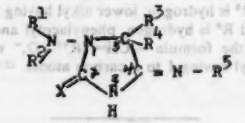
Amedeo Failli, Montreal, and Manfred Gotz, Hudson, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 301,413, Oct. 27, 1972, Pat. No. 3,904,629, which is a division of Ser. No. 55,952, July 17, 1970, Pat. No. 3,707,472. This application June 9, 1975, Ser. No. 585,019

Int. Cl.² C07D *401/04*, *403/04*

U.S. Cl. 260—239.7 4 Claims

1. A compound selected from those of the formula



in which R^1 and R^2 together with the nitrogen atom to which they are attached form an azepino ring; R^3 is selected from the group which consists of hydrogen and lower alkyl; R^4 is lower alkyl; R^5 is selected from the group which consists of cycloalkyl having 5-6 carbon atoms; X is selected from the group which consists of oxygen and sulfur; or acid addition salts thereof with pharmacologically acceptable acids.

2. The hydrochloric salt of 4-cyclohexylimino-5-isopropyl-1-piperidinoimidazolidin-2-one, as claimed in Claim 1.

3,979,381

THIOPYRANO[4,3-c]PYRAZOLES

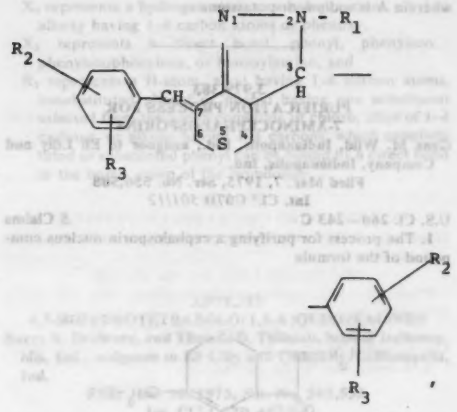
George C. Rovnyak, Hopewell, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 11, 1975, Ser. No. 603,580

Int. Cl.² C07D *231/54*, *495/02*

U.S. Cl. 260—240 A 28 Claims

1. A compound having the formula



or a pharmaceutically acceptable acid addition salt thereof, or a 5-oxide or 5,5-dioxide thereof, wherein R_1 is hydrogen, alkyl, aryl, arylalkyl, or

wherein X is alkyl or aryl; and R_2 and R_3 are the same or different and are hydrogen, alkyl, hydroxy, alkoxy, alkylthio, alkylsulfinyl, trifluoromethyl, halogen,

cyano, nitro or dialkylamino; wherein the terms alkyl and alkoxy refer to groups having 1 to 8 carbon atoms and the term aryl refers to phenyl or phenyl monosubstituted with an alkyl, alkoxy, halogen, or trifluoromethyl group.

3,979,382

DICHLOROCYANURATE SILVER COMPLEXES

Francisco Martinez-Alvarez; Antonio Gamero Briones, both of Barcelona, and Enrique Dominguez Buron, Badalona, all of Spain, assignors to Sociedad Anonima Cros, Barcelona, Spain

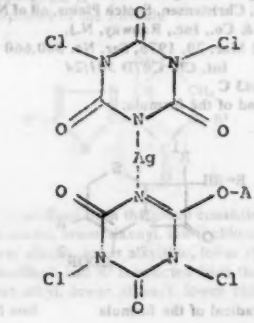
Filed Nov. 11, 1974, Ser. No. 522,894

Claims priority, application Spain, Nov. 15, 1973, 420561

Int. Cl.² C07D *251/36*

U.S. Cl. 260—242 7 Claims

1. A chlorocyanurate silver complex having the formula



I

wherein A is sodium or potassium.

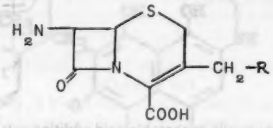
3,979,383

PURIFICATION PROCESS FOR 7-AMINOCEPHALOSPORINS

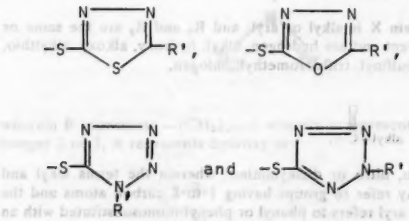
Gene M. Wild, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 7, 1975, Ser. No. 556,508
Int. Cl.[2] C07D 501/12
U.S. Cl. 260—243 C 5 Claims

1. The process for purifying a cephalosporin nucleus compound of the formula



wherein R is a heterocyclic ring selected from the group consisting of



wherein R′ is C_1–C_4 alkyl, which comprises adsorbing said nucleus from an aqueous solution thereof at a pH between 6.5 and 8.5 on the polyacrylic quaternary methylammoniun anion exchange resin Amberlite IRA 458; eluting said resin with phosphate buffer at a pH between 7.5 and 9.0 acidifying the eluate to a pH of between 3.5 and 5.5; and separating said nucleus in a purified form from said acidified eluate.

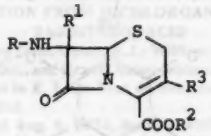
3,979,384

C-3 SUBSTITUTED CEPHALOSPORINS

Raymond A. Firestone, Fanwood; John L. Fahey, Matawan, and Burton G. Christensen, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

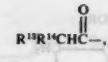
Filed Mar. 20, 1975, Ser. No. 560,660
Int. Cl.[2] C07D 501/24
U.S. Cl. 260—243 C 7 Claims

1. A compound of the formula:



wherein

R is an acyl radical of the formula



wherein

R^{13} is hydrogen; halo selected from the group consisting of fluoro, chloro and bromo; amino; lower alkyl amino, wherein the lower alkyl has 1 to 6 carbon atoms; guanidino; phenyl; halophenyl; phosphono; sulfamino; N-lower alkyl sulfamino wherein the lower alkyl has 1 or 2 carbon atoms; hydroxy; (1H)-tetrazolyl; sulfo; carboxy; sulfamyl; N-lower alkyl sulfamyl wherein the lower alkyl contains from 1 to 2 carbon atoms; and azide;

R^{14} is alkyl having 1 to 6 carbon atoms; substituted alkyl having 1 to 6 carbon atoms, wherein the substituent is amino; carboxy; alkene having 2 to 4 carbon atoms; phenyl; substituted phenyl wherein the substituent is halo, aminomethyl, carboxylmethyl, carboamidomethyl, hydroxy, nitro, guanidino, guanidinomethyl, methoxy, or methyl; 5-membered monocyclicheterocycle having one oxygen, one sulfur, one oxygen and two nitrogens, one sulfur and one nitrogen, one sulfur and two nitrogens, or four nitrogens in the ring selected from the group consisting of furyl, thienyl, thiazolyl, isothiazolyl, oxadiazolyl, thiadiazolyl and tetrazolyl; substituted 5-membered monocyclicheterocycle wherein the substituent is nitro, halo, methoxy or methyl; lower alkylthio wherein the lower alkyl has 1 to 4 carbon atoms; lower alkenethio wherein the alkene has 1 to 4 carbon atoms; substituted lower alkene thio wherein the substituent is halo; phenylthio; carboxy or cyano;

R^1 is hydrogen or methoxy;

R^2 is hydrogen or a protecting group selected from methyl, trichloroethyl, tert-butyl, benzoylmethyl, p-methoxybenzyl, benzyl, benzhydryl, methoxymethyl or a pharmaceutically acceptable salt;

R^3 is selected from the group consisting of nitrile imine of the formula $-C{\equiv}N^+-N^--R^4$, wherein R^4 is lower alkyl having 1 to 6 carbon atoms, phenylsufonyl, p-toluenesulfonyl; nitrile oxide of the formula $-C{\equiv}N^+-O^-$; diazomethyl of the formula $-CH^--N^+{\equiv}N$; azomethine imine of the formula $-CH{=}NR^{+5}-NR^{-6}$, wherein R^5 is hydrogen, lower alkyl having 1 to 6 carbon atoms and R^6 is hydrogen, phenylacetyl and azomethine oxide of the formula $-CH{=}NR^{+7}-O^-$ wherein R^7 is lower alkyl having 1 to 6 carbon atoms.

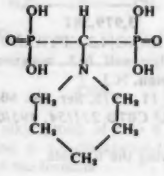
3,979,385

1-AMINOALKANE-1,1-DIPHOSPHONIC ACIDS AND THEIR SALTS

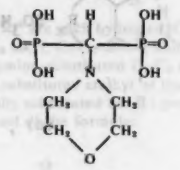
Klaus Wollmann; Walter Ploger, both of Hilden, and Karl-Heinz Worms, Dusseldorf-Holthausen, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Division of Ser. No. 90,454, Nov. 17, 1970, Pat. No. 3,846,420.
This application May 31, 1974, Ser. No. 475,207
Claims priority, application Germany, Nov. 19, 1969, 1958123
Int. Cl.[2] C07D 295/04
U.S. Cl. 260—247 2 Claims

1. Piperidinomethane-1,1-diphosphonic acid of the formula



2. Morpholinomethane-1,1-diphosphonic acid of the formula



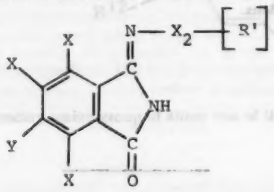
3,979,386

IMINOISOINDOLINE PIGMENTS AND PROCESSES FOR THE PREPARATION THEREOF

Jost von der Crone; André Pugin, both of Riehen, and Rudolf Mory, Dornach, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

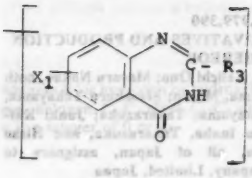
Filed May 22, 1974, Ser. No. 472,401
Claims priority, application Switzerland, May 29, 1973, 7718/73; May 29, 1973, 7719/73
Int. Cl.² C07D *401/12, 403/12, 413/12, 417/12*
U.S. Cl. 260—256.4 Q 9 Claims

1. An iminoisoindolinone of the formula

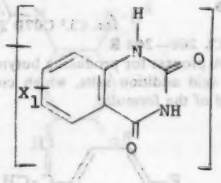


wherein

R′ represents



or



X represent halogen atoms,

Y represents a halogen atom, alkoxy of 1–4 carbon atoms, phenoxy, chlorophenoxy, methylphenoxy,, or alkylthio of 1 or 2 carbon atoms,

X_1 represents a hydrogen atom or a halogen atom, alkyl or alkoxy having 1–4 carbon atoms or phenoxy,

X_2 represents a direct bond, phenyl, phenylazo, phenylazophenylene, or benzoylamino, and

R_3 represents a H-atom, alkyl having 1–4 carbon atoms, unsubstituted phenyl or phenyl having one substituent selected from the group consisting of chloro, alkyl of 1–4 carbons, or alkoxy having 1–4 carbons, which unsubstituted or substituted phenyl can be bound by a direct bond to the imino group of the isoindoline.

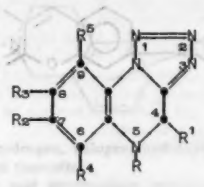
3,979,387

4,5-DIHYDROTETRAZOLO(1,5-A)QUINOXALINES

Barry A. Dreikorn, and Thomas D. Thibault, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed June 10, 1975, Ser. No. 585,533
Int. Cl.² C07D *487/04*
U.S. Cl. 260—250 Q 6 Claims

1. A compound of the formula:



wherein

R and R^1 independently represent hydrogen, ethyl or methyl;

R^2, R^3, R^4 and R^5 independently represent ethyl, methyl, chloro, fluoro, bromo or hydrogen; provided that at least four of R, R^1, R^2, R^3, R^4 and R^5 represent hydrogen.

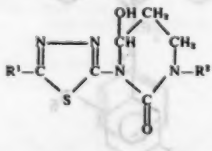
3,979,388

THIADIAZOLYLTETRAHYDROPYRIMIDINONES

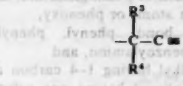
John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Sept. 11, 1974, Ser. No. 505,118
The portion of the term of this patent subsequent to Aug. 26, 1992, has been disclaimed.
Int. Cl.² C07D *417/00*
U.S. Cl. 260—256.5 R 8 Claims

1. A compound of the formula



wherein R^1 is selected from the group consisting of alkyl of up to 4 carbon atoms, lower alkenyl, lower chloroalkyl, trifluoromethyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl and lower alkylsulfinyl; and R^2 is selected from the group consisting of lower alkyl, lower alkenyl, lower chloroalkyl, lower bromoalkyl and



wherein R^3 and R^4 are selected from the group consisting of hydrogen and alkyl of up to 3 carbon atoms.

3,979,389

SULPHONATED COUMARIN DERIVATIVES

Werner Koch, Oberwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

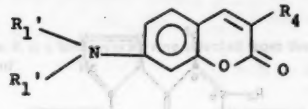
Filed Oct. 15, 1974, Ser. No. 514,608

Claims priority, application Switzerland, Oct. 17, 1973, 14712/73

Int. Cl.² C07D *239/72*

U.S. Cl. 260—256.5 R **12 Claims**

1. A compound of the formula Ia,

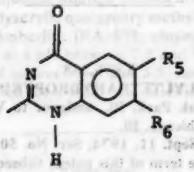


Ia

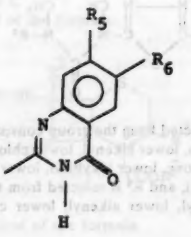
in which,

each R_1', which may be the same or different, is (C_{1-4}) alkyl or (C_{2-3}) alkyl substituted by chloro or cyano,

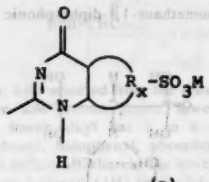
R_4 is a radical of formula (c), (d), (e) or (f),



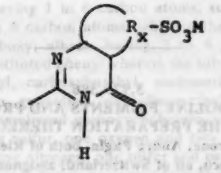
(c),



(d),



(e),



(f)

in which,

one of R_5 and R_6 is $-SO_3M$, where M is a hydrogen ion or a cation equivalent, and the other is hydrogen, chloro, bromo, (C_{1-4}) alkyl, (C_{1-4}) alkoxy, (C_{1-4}) alkylcarbonyl or (C_{1-4}) alkylcarbonylamino, and

R_x is the atoms necessary to form a condensed further unsubstituted 1,2- or 2,3-naphthalene ring in which the SO_3M group is bound to the ring remote from the coumarin nucleus.

3,979,390

BUTYROPHENONE DERIVATIVES AND PRODUCTION THEREOF

Kikuo Sasajima, Toyonaka; Keiichi Ono; Masaru Nakao, both of Osaka; Isamu Maruyama, Minoo; Masaharu Takayama, Toyonaka; Shigenari Katayama, Takarazuka; Junki Katsube, Toyonaka; Shigeho Inaba, Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

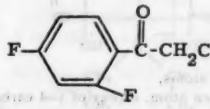
Filed Mar. 16, 1973, Ser. No. 341,858

Claims priority, application Japan, Mar. 18, 1972, 47-27610

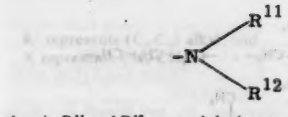
Int. Cl.² C07D *295/10*

U.S. Cl. 260—268 R **6 Claims**

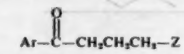
1. A process for producing butyrophenone derivatives and their acid addition salts, which comprises reacting a compound of the formula:



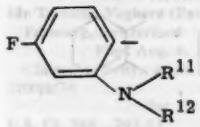
with a secondary amine of the formula:



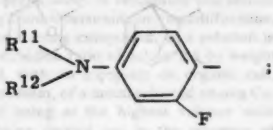
wherein R^{11} and R^{12} are each hydrogen, C_1-C_8 alkyl, hydroxy-substituted C_1-C_8 alkyl, C_1-C_4 alkoxy substituted C_1-C_8 alkyl, di(C_1-C_4 alkyl) amino-substituted C_1-C_8 alkyl, C_3-C_7 cycloalkyl or optionally substituted aralkyl, at least one of R^{11} and R^{12} being an optionally substituted benzyl group, to give an intermediate compound of the formula:



wherein Ar is a group of either one of the formulas:

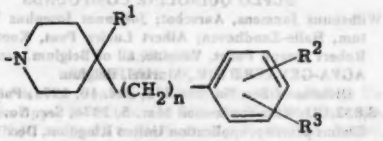


and

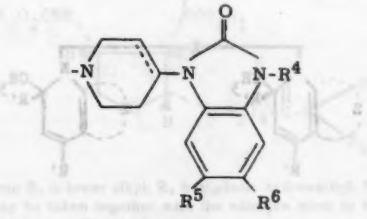


;

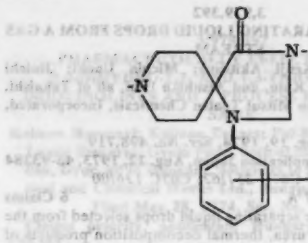
Z is a secondary amino group of either one of the formulas:



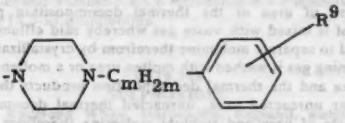
wherein R^1 is hydrogen or hydroxyl, R^2 and R^3 are each hydrogen, halogen, C_1-C_4 alkyl, C_1-C_4 alkoxy or trifluoromethyl and n is a integer of 0 or 1;



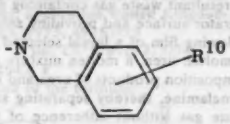
wherein R^4 is hydrogen or C_1-C_4 alkyl, R^5 and R^6 are each hydrogen, halogen or C_1-C_4 alkyl and the dotted line is an optional bond between the carbon atoms at the 3- and 4-positions of the piperidine ring,



wherein R^7 is hydrogen or C_1-C_4 alkyl and R^8 is hydrogen, halogen, C_1-C_4 or C_1-C_4 alkoxy,



wherein R^9 is hydrogen, halogen, C_1-C_4 alkyl, C_1-C_4 alkoxy or trifluoromethyl and m is an integer of 0, 1 or 2, and



wherein R^{10} is hydrogen, halogen, hydroxyl, C_1-C_4 alkyl or C_1-C_4 alkoxy; and thereafter

hydrogenating said intermediate compound to give the corresponding compound wherein the optionally substituted benzyl group is eliminated.

3,979,391

1,2,3,4-TETRAHYDROCARBAZOLES

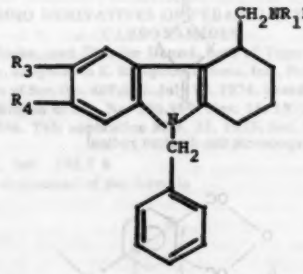
Ernest John Alexander, East Greenbush, and Aram Mooradian, Schodack, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 308,674, Nov. 22, 1972, Pat. No. 3,939,177. This application Aug. 4, 1975, Ser. No. 601,492

Int. Cl.² C07D *209/86, 401/04*

U.S. Cl. 260—268 TR **16 Claims**

1. 4-$R_1R_2NCH_2$-9-benzyl-6-R_3-7-R_4-1,2,3,4-tetrahydrocarbazole having the formula:



wherein

NR_1R_2 is 1-pyrrolidyl or 1-piperidyl;

and

R_3 and R_4 are each hydrogen, lower-alkyl, or lower-alkoxy.

3,979,392

METHOD OF SEPARATING LIQUID DROPS FROM A GAS STREAM

Tomoki Eguchi; Kenji Akitsune; Michio Unoki; Jinichi Kataoka; Toshiki Kato, and Atsuhiko Hiai, all of Takaishi, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Aug. 19, 1974, Ser. No. 498,719
Claims priority, application Japan, Aug. 22, 1973, 48-93284
Int. Cl.² C07D 251/62; C07C 126/00
U.S. Cl. 260—249.7 A 6 Claims

1. In a method for separating liquid drops selected from the group consisting of urea, thermal decomposition products of urea, and mixtures thereof with residual melamine contained in the waste gas from a melamine recovery process wherein a melamine synthesis effluent gas obtained by thermal decomposition of urea or the thermal decomposition products thereof is mixed with waste gas whereby said effluent gas is cooled to separate melamine therefrom by crystallization, the remaining gas is washed with molten urea or a molten mixture of urea and the thermal decomposition products thereof to recover unreacted urea, unreacted thermal decomposition products of urea and residual melamine therefrom, and at least a portion of the resultant waste gas is separated from liquid drops contained therein and then recirculated for mixing with said effluent gas, the improvement which comprises colliding said resultant waste gas containing said liquid drops against a separator surface and providing said surface with a downwardly flowing film of a liquid selected from the group consisting of molten urea, a molten mixture of urea and the thermal decomposition products of urea and molten mixtures thereof with melamine, thereby separating said liquid drops from said waste gas without adherence of solidified liquid drops on said separator surface.

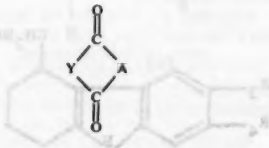
3,979,393

IMIDYL- AND ISOIMIDYL-PHTHALIC ANHYDRIDES, PROCESS FOR THEIR MANUFACTURE AND THEIR USE FOR CURING EPOXIDE RESINS

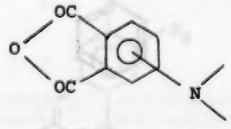
Vratislav Kvita, Muttenz; Roland Darms, Therwil, and Gerd Greber, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 9, 1974, Ser. No. 531,030
Claims priority, application Switzerland, Dec. 20, 1973, 17903/73
Int. Cl.² C07D 405/04, 405/10
U.S. Cl. 260—281 G 1 Claim

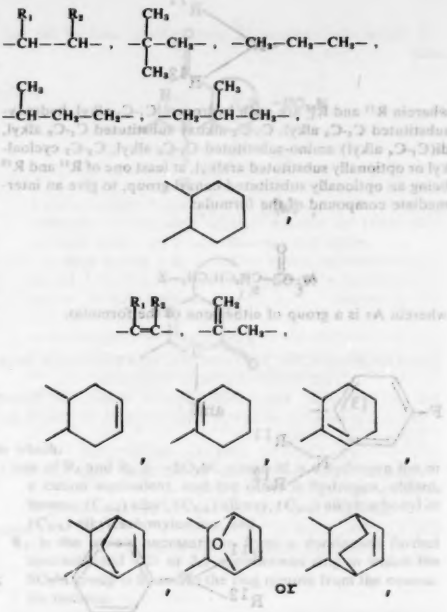
1. Imidyl-phthalic anhydrides of the formula



wherein Y represents the divalent radical



and A represents a divalent radical selected from the group consisting of



R_1 and R_2 independently of one another denote hydrogen, chlorine, bromine or methyl.

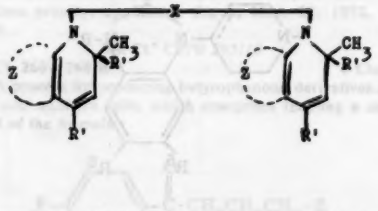
3,979,394

DUPLO QUINOLINE COMPOUNDS

Wilhelmus Janssens, Aarschot; Johannes Josephus Vanheertum, Halle-Zandhoven; Albert Lucien Poot, Kontich, and Robert Joseph Pollet, Vremde, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Division of Ser. No. 206,872, Dec. 10, 1971, Pat. No. 3,832,171. This application Mar. 5, 1974, Ser. No. 448,267
Claims priority, application United Kingdom, Dec. 11, 1970, 59094/70
Int. Cl.² C07D 215/02
U.S. Cl. 260—283 BZ 2 Claims

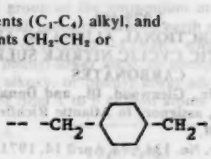
1. A chemical compound corresponding to the following formula:



wherein:

Z represents the necessary atoms to close and adjacent benzene or fluorene nucleus or,

R′ represents (C_1-C_4) alkyl, and
X represents CH_2-CH_2 or



3,979,395

PROCESS FOR THE PREPARATION OF VINCAMINE AND OTHER INDOLE ALKALOIDS

Ida Taccone, Voghera (Pavia), Italy, assignor to Buskine S.A., Fribourg, Switzerland

Filed Aug. 6, 1975, Ser. No. 602,520
Claims priority, application Switzerland, Aug. 9, 1974, 10940/74
Int. Cl.² C07D 471/22
U.S. Cl. 260—293.53 8 Claims

1. A method for the preparation of vincamine and similar indole alkaloids, starting from tabersonine or vincadifformine, characterized in that the starting compound, as a solution in a polar solvent, is added, in the ratio of 1:1 to 1:5 by weight of the starting alkaloid, with an inorganic or organic salt, soluble in the reaction medium, of a metal selected among Cu, Fe and Co, said metal being at the highest valence state thereof, the reaction being carried out in the presence of oxygen, at a temperature of between 10° and 50°C and for a time of between 5 and 15 days.

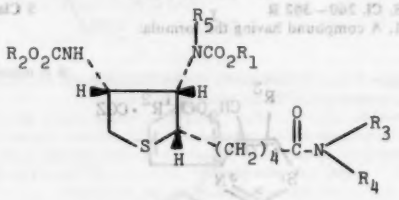
3,979,396

SYNTHESIS OF BIOTIN

Pasquale Nicholas Confalone, Bloomfield; Milan Radoje Uskokovic, Upper Montclair, and Giacomo Pizzolato, Belleville, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 3, 1973, Ser. No. 420,811
Int. Cl.² C07D 405/00
U.S. Cl. 260—293.68 7 Claims

1. A compound of the formula:



wherein R_1 is lower alkyl; R_3 is aliphatic hydrocarbyl; R_3 and R_4 may be taken together with the nitrogen atom to form a piperidide ring; R_5 is hydrogen or

and R_6 is lower alkyl.

3,979,397

PHARMACEUTICALLY EFFECTIVE NOVEL 3,4-DIHYDRO-1,2- AND 1,3-THIOZOLO [4,3a] ISOQUINOLINES AND A PROCESS FOR PREPARING SAME

Kalman Harsanyi; Kalman Takacs; Pal Kiss, all of Budapest; Laszlo Szekeres; Gyula Papp, both of Szeged, and Eva Benedek, Gyor, all of Hungary, assignors to Chinoin Pharmaceutical and Chemical Works Ltd., Budapest, Hungary

Filed May 28, 1974, Ser. No. 473,918
Claims priority, application Hungary, May 30, 1973, CI1381
Int. Cl.² C07D 513/04
U.S. Cl. 260—288 CF 1 Claim

1. 1-cyano-3-imino-3,4,5,6-tetrahydro-8,9-dimethoxy-1,3-thiazolo [4,3-a] isoquinoline.

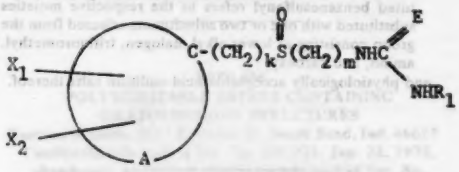
3,979,398

SULPHOXIDES

George Raymond White, Harpenden, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 436,285, Jan. 24, 1974, Pat. No. 3,932,443. This application Oct. 30, 1975, Ser. No. 627,418
Claims priority, application United Kingdom, Feb. 8, 1973, 6153/73; Oct. 23, 1973, 49257/73
Int. Cl.² C07D 213/34
U.S. Cl. 260—294.8 F 12 Claims

1. A compound of the formula:



wherein A is such that the heterocyclic nucleus formed is a pyridine ring; X_1 and X_2, which may be the same or different are hydrogen, lower alkyl, trifluoromethyl, hydroxyl, halogen, amino, or X_1 may with X_2 and at least two of the atoms comprising A form a further ring; k is 0 to 2 and m is 2 or 3 provided that the sum of k and m is 3 or 4; E is oxygen, sulphur or NR_3; R_1 is hydrogen, lower alkyl, benzoyl or dimethylaminomethyl; and R_2 is hydrogen, nitro, cyano, alkanesulphonyl having 1 to 3 carbon atoms, benzenesulfonyl, halobenzenesulfonyl or toluenesulfonyl.

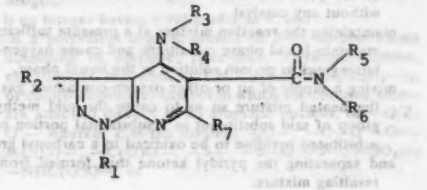
3,979,399

AMINO DERIVATIVES OF PYRAZOLOPYRIDINE CARBOXAMIDES

Hans Hoehn, and Theodor Denzel, both of Tegernheim, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 489,636, July 18, 1974, abandoned, which is a division of Ser. No. 306,967, Nov. 15, 1972, Pat. No. 3,840,546. This application Mar. 25, 1975, Ser. No. 561,743
Int. Cl.² C07D 471/04
U.S. Cl. 260—295.5 B 4 Claims

1. A compound of the formula



wherein

r_1 is selected from the group consisting of hydrogen, lower alkyl, phenyl, phenyl-lower alkyl, and cycloalkyl of 3 to 7 carbon atoms;

R_2 is selected from the group consisting of hydrogen, lower alkyl, and phenyl;

the basic nitrogen group

is selected from the group consisting of

acyclic amino groups wherein R_3 and R_4 are each selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, lower alkanoyl, phenyl, substituted phenyl, phenyl-lower alkyl, di-lower alkyl amino-lower alkyl, benzoyl, substituted benzoyl, phenyl-lower alkanoyl, substituted phenyllower alkanoyl, lower alkane sulfonyl, benzenesulfonyl, and substituted benzenesulfonyl and

R_5 is alkoxy lower alkyl or dialkoxy lower alkyl;

R_6 is hydrogen or lower alkyl;

R_7 is selected from the group consisting of hydrogen, lower alkyl, and phenyl;

wherein lower alkyl and lower alkenyl refer to hydrocarbon groups having 1 to 8 carbon atoms;

wherein lower alkanoyl refers to acyl radicals of acids having the formula $C_nH_{2n+1}COOH$ wherein n must be 7 or less;

wherein substituted phenyl, substituted benzoyl, and substituted benzenesulfonyl refers to the respective moieties substituted with one or two substituents selected from the group consisting of lower alkyl, halogen, trifluoromethyl, amino, and carboxy;

and physiologically acceptable acid-addition salts thereof.

3,979,400

PRODUCTION OF PYRIDYL KETONES

William H. Rieger, and Ernest W. Crowe, both of Indianapolis, Ind., assignors to Reilly Tar & Chemical Corporation, Indianapolis, Ind.

Filed Dec. 11, 1974, Ser. No. 531,555

Int. Cl.² C07D 213/50

U.S. Cl. 260—297 R **20 Claims**

1. The method of producing a pyridyl ketone from a substituted pyridine containing at least one substituent which is a lower alkyl group having from 2 to 8 carbon atoms or an arylmethylene group, connected to a carbon of the pyridine nucleus by a methylene radical of such group, which comprises the steps of

heating the substituted pyridine to an elevated reaction temperature of from about 100° C. to about 300° C.,

without the addition of carboxylic acid,

with or without the addition of a minor proportion of an inert vapor pressure additive,

with a catalytic amount, not exceeding about 5% by weight of the pyridine, of an inorganic oxidation catalyst, or without any catalyst,

maintaining the reaction mixture at a pressure sufficient to maintain liquid phase conditions and cause oxygen-containing gas to go into solution in the liquid phase,

mixing a supply of air or other oxygen-containing gas with the heated mixture so as to cause the said methylene group of said substituent in a substantial portion of the substituted pyridine to be oxidized to a carbonyl group,

and separating the pyridyl ketone thus formed from the resulting mixture.

3,979,401

POLYFUNCTIONAL ALIPHATIC AND CYCLOALIPHATIC CYCLIC NITRILE SULFITES AND CARBONATES

Emmett H. Burk, Jr., Glenwood, Ill., and Donald D. Carlos, Middletown, Ky., assignors to Atlantic Richfield Company, Los Angeles, Calif.

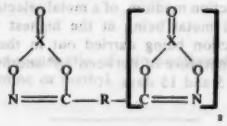
Continuation of Ser. No. 134,043, April 14, 1971, abandoned, which is a continuation-in-part of Ser. No. 713,997, March 18, 1968, abandoned, which is a continuation-in-part of Ser. No. 502,327, Oct. 22, 1965, abandoned, and Ser. No. 502,464, Oct. 22, 1965, abandoned. This application Feb. 27, 1974, Ser. No. 442,706

Int. Cl.² C07D 291/04

U.S. Cl. 260—301 **6 Claims**

1. A compound selected from the group consisting of: malonodi(nitrile carbonate); malonodi(nitrile sulfite); succinodi(nitrile carbonate); succinodi(nitrile sulfite); glutarodi(nitrile carbonate); glutarodi(nitrile sulfite); adipodi(nitrile carbonate); adipodi(nitrile sulfite); pimelodi(nitrile carbonate); pimelodi(nitrile sulfite); suberodi(nitrile carbonate); suberodi(nitrile sulfite); azelaodi(nitrile carbonate); cetylmalonodi(nitrile carbonate); cetylmalonodi(nitrile sulfite); thapsodi(nitrile carbonate); thapsodi(nitrile sulfite); japanodi(nitrile carbonate); japanodi(nitrile sulfite); cyclohexyldi(nitrile carbonate); cyclohexyldi(nitrile sulfite); 4-bromo-1,6-hexanedi(nitrile carbonate); 4-bromo-1,6-hexanedi(nitrile sulfite); 2-chloro-1,9-nonanedi(nitrile carbonate); 2-chloro-1,9-nonanedi(nitrile sulfite).

5. Compositions of matter having the structural formula:



wherein R is an unsubstituted straight chain aliphatic hydrocarbon of 1 to 30 carbon atoms, X is sulfur or carbon, and no two cyclic nitrile functional groups are attached to the same carbon atom.

3,979,402

THIAZOLE DERIVATIVES

Robert Anthony Newberry, Portsmouth, and Brian John Bushell, Southampton, both of England, assignors to John Wyeth & Brother, Maidenhead, England

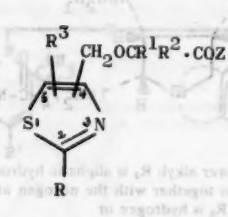
Filed Feb. 24, 1975, Ser. No. 552,097

Claims priority, application United Kingdom, Feb. 27, 1974, 8870/74

Int. Cl.² C07D 277/22

U.S. Cl. 260—302 R **5 Claims**

1. A compound having the formula:



wherein R represents phenyl or phenyl mono-substituted by a halogen, lower alkyl, lower alkoxy, nitro, amino, methylene dioxy, or trifluoromethyl group; R^1 and R^2 independently represent hydrogen or lower alkyl; R^3 represents hydrogen or lower alkyl; and —COZ represents the amide group, the car-

boxylic acid group or the ammonium or a pharmaceutically acceptable alkali metal or alkaline earth metal salt thereof, or an ester group of formula —COOR⁴, wherein R⁴ represents a lower alkyl, phenyl lower alkyl, or phenyl radical; said lower alkyl, lower alkoxy, or phenyl lower alkyl groups having an alkyl chain of from 1 to 6 carbon atoms.

3,979,403

PROCESS FOR THE PREPARATION OF 3-TRICHLOROMETHYL-5-CHLORO-1,2,4-THIADIAZOLE

Philip M. Pivawer, Hamden, and Douglas A. Farmer, Jr., West Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 465,773, May 1, 1974, abandoned. This application Mar. 31, 1975, Ser. No. 561,765

Int. Cl.² C07D *285/08*

U.S. Cl. 260—302 D 10 Claims

1. In a process for preparing 3-trichloromethyl-5-chloro-1,2,4-thiadiazole wherein trichloroacetamidine or its hydrochloride is reacted with trichloromethanesulfenyl chloride in the presence of an inert immiscible organic solvent and the resulting adduct cyclized, the improvement which comprises:

reacting trichloromethanesulfenyl chloride with a 1 to 25% molar excess of trichloroacetamidine at a temperature in the range of −20°C. to 50°C. while adding a base selected from the group consisting of an alkali metal hydroxide, carbonate or bicarbonate at a rate sufficient to maintain the pH of the reaction mixture within the range of 5–10, said molar excess being at least as great as the value of the expression (1.01 − 1.075) (moles PCMM) + 2(moles S_2Cl_2 per mole PCMM) wherein PCMM represents trichloromethanesulfenyl chloride.

3,979,404

2-SUBSTITUTED-1,2,4-THIADIAZOLO-[2,3-A]-IMIDAZOLES

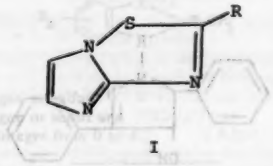
Colin C. Beard, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 403,473, Oct. 4, 1973, Pat. No. 3,901,903. This application Jan. 10, 1975, Ser. No. 540,023

Int. Cl.² C07D *417/14*

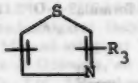
U.S. Cl. 260—306.8 F 11 Claims

1. A compound represented by the formula:



I

wherein R is

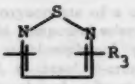


,

,

,

and



in which R_3 is hydrogen, lower alkoxy, halo, nitro, or lower alkyl; and the pharmaceutically acceptable salts thereof.

3,979,405

2-OXAZOLINE DERIVATIVES

István Tibor Tóth; Pál Bite; György Magyar; Eszter Diszler; József Borsy; Andrea Maderspach; István Polgári; Sándor Elek, and István Elekes, all of Budapest, Hungary, assignors to Gyogyszer- es Vegyeszeti Termekek Gyara RT., Budapest, Hungary

Filed Oct. 16, 1973, Ser. No. 406,784

Claims priority, application Hungary, Oct. 20, 1972, GO1222

Int. Cl.² C07D *263/14*

U.S. Cl. 260—307 F 5 Claims

1. 2-[(p-chlorophenoxy-isopropyl]-4-methyl-4-hydroxymethyl-2-oxazoline.

4. 2- [4-(4′-chlorophenoxy-phenoxy]-isopropyl -4,4-bis-hydroxymethyl-2-oxazoline.

3,979,406

POLYMERIZABLE ESTERS CONTAINING OXAZOLIDINONE STRUCTURES

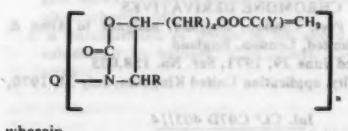
Gaetano D'Alelio, 2011 E. Cedar St., South Bend, Ind. 46617

Continuation-in-part of Ser. No. 325,921, Jan. 22, 1973, abandoned, which is a continuation-in-part of Ser. No. 150,812, June 7, 1971, abandoned, which is a continuation of Ser. No. 778,826, Nov. 25, 1968, abandoned. This application Jan. 2, 1975, Ser. No. 538,173

Int. Cl.² C07D *263/06*

U.S. Cl. 260—307 C 10 Claims

1. A polymerizable polyoxazolidinone compound having the formula



wherein

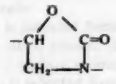
n is an integer having a value of at least 2 and no more than 12,

Y represents H, CH_3 or CN,

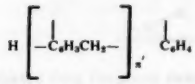
R has no more than 10 carbon atoms and represents hydrogen, or alkyl, cycloalkyl, phenyl, naphthyl, and alkylated phenyl in which the total number of carbon atoms in the alkyl groups does not exceed 4, except that in the $(CHR)_x$ no more than one R represents anything other than hydrogen,

x is an integer having a value of 1 to 8, and

Q is a polyvalent organic moiety of 2–83 carbon atoms consisting of alkylene, phenylene, xylylene, tolylene, naphthylene, diphenylene, $CH(C_6H_4—)_2$, $CH_3(C_6H_4—)_2$, or chloro derivatives thereof in which the chlorine atoms are attached directly to an aromatic nucleus, or —Q′Z-Q′— wherein Z is the divalent —O—, —O—Q′—O—, —C(O)—, —C(O)O—, —S—, —S—Q′—S—, —SO_2—, —NHC(O)O—, or



and Q' is phenylene, tolylene, xylylene, naphthylene or alkylene of 2–20 carbon atoms;



wherein n' is 2–12;

$-C_6H_3(CH_3)NHC(O)O[CH_2C(CH_3)O]_n$

$(O)CNHC_6H_3(CH_3)-$ wherein n is 2–12;

$C_3H_5O_3[-CH(CH_3)CH_2OCH(CH_3)CH_2-]_3$;

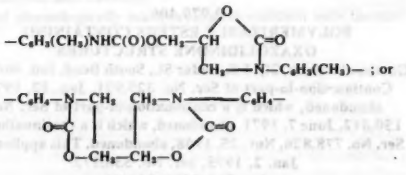
$C[-CH_2O(CH_2CH_2O)_4-]_4$;

$C(CH_2)_3[C_6H_4OCH_2CH_2OOCNHC_6H_4-]_3$;

$CH_3COOCH_2CH_2OOCNH(CH_2)_6-$

$CH_3COOCH_2CH_2OOCNH(CH_2)_6-$;

$-C_6H_3(CH_2(CH_2)NHC(O)[OCH_2CH_2O(O)CCH=CHC(O)]_2OCH_2CH_2(O)OCNHC_6H_3-(CH_2)$;



3,979,407

CHROMONE DERIVATIVES

Mervyn Evan Peel, London, England, assignor to Allen & Hanburys Limited, London, England

Filed June 29, 1971, Ser. No. 158,055

Claims priority, application United Kingdom, July 31, 1970, 37114/70

Int. Cl.[2] C07D *405/14*

U.S. Cl. 260—308 D 1 Claim

1. 5,5'-[(2-Hydroxytrimethylene)dioxy]bis[2(1H-tetrazol-5-yl)chromone] or a non-toxic pharmaceutically acceptable salt thereof.

3,979,408

2-(PYRROL-1-YL)AMINO-4,5-DIHYDRO-1H-IMIDAZOLE DERIVATIVES

Aldo Trani, Milan, Italy, assignor to Gruppo Lepetit S.p.A., Milan, Italy

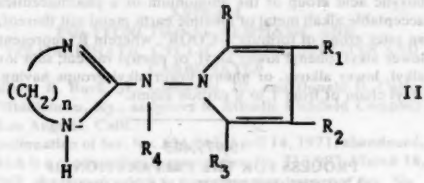
Filed May 24, 1974, Ser. No. 473,038

Claims priority, application United Kingdom, May 25, 1973, 25129/73

Int. Cl.[2] C07D *49/34*

U.S. Cl. 260—309.6 3 Claims

1. A compound of the formula



II

wherein R, R_1, R_2, R_3 may be the same or different and are independently selected from the class consisting of hydrogen, lower alkyl, carbo-lower alkoxy, phenyl, substituted phenyl, R_4 represents hydrogen or lower alkyl, n is 2, and a pharmaceutically acceptable acid addition salt thereof.

3,979,409

NOVEL PROCESS FOR THE PREPARATION OF 3,5-DIPHENYL-4-PYRAZOLOL AND CERTAIN DERIVATIVES THEREOF

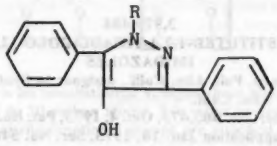
Barrington Cross, Rocky Hill, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Oct. 20, 1975, Ser. No. 624,156

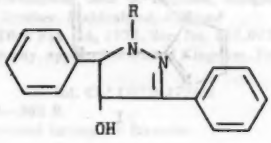
Int. Cl.[2] C07D *231/18*

U.S. Cl. 260—310 R 7 Claims

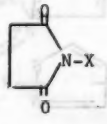
1. A method for the preparation of a compound of the formula:



wherein R is selected from the group consisting of hydrogen and C_1–C_6 alkyl comprising the steps of: reacting a molar equivalent of a compound of the formula:



wherein R is as defined above, with a 1 to 1.2 molar equivalent of a compound of the formula:



wherein X is bromine or chlorine, in the presence of an inert chlorinated hydrocarbon solvent at a temperature ranging between about 20° and 100°C, and recovering said 3,5-diphenylpyrazol-4-ol in good yield.

3,979,410

INTERMEDIATE α-ACYL-β-DIALKYLAMINO-2-NITROSTYRENES

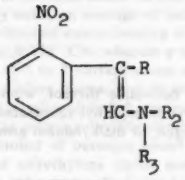
Rodney Ian Fryer, North Caldwell, and Edward Ernest Garcia, West Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 435,050, Jan. 21, 1974, Pat. No. 3,931,225. This application Sept. 22, 1975, Ser. No. 615,436

Int. Cl.² C07D *209/48*

U.S. Cl. 260—326 N 4 Claims

1. A compound of the formula



wherein R is lower alkanoyl, halo-lower alkanoyl, phthalimido-lower alkanoyl, benzoyl or benzoyl substituted by one to three members selected from the group consisting of halogen, lower alkyl, and lower alkoxy, and R_2 and R_3, independently, are lower alkyl or when taken together, are lower alkylene.

3,979,411

2-TRIFLUOROMETHYLIMINO-BENZO-HETEROCYCLIC COMPOUNDS

Gerhard Buttner, Cologne; Erich Klauke, Odenthal-Hahnenberg; Paul-Ernst Frohberger, Leverkusen, and Ingeborg Hammann, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

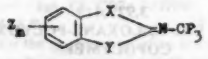
Division of Ser. No. 344,800, March 26, 1973, Pat. No. 3,884,931. This application Jan. 30, 1975, Ser. No. 545,657

Claims priority, application Germany, Apr. 15, 1972, 2218329

Int. Cl.² C07D *317/66, 339/06, 327/04*

U.S. Cl. 260—327 M 6 Claims

1. A 2-trifluoromethylimino benzoheterocyclic compound with five-members in the heterocyclic ring of the formula



(I)

in which

X is oxygen or sulfur,

Y is oxygen or sulfur and

m is an integer from 0 to 4.

3,979,412

PROCESS FOR PRODUCING 3-ANILINO-5-PYRAZOLONES

Atsuaki Arai, Minami-ashigara; Daijiro Nishio, Odawara; Mitsugu Tanaka, Minami-ashigara; Yoshikazu Fujita, and Hisao Suzuki, both of Odawara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 30, 1974, Ser. No. 519,310

Claims priority, application Japan, Oct. 30, 1973, 48-121955

Int. Cl.² C07D *231/52*

U.S. Cl. 260—310 A 5 Claims

1. In a process wherein a β-anilino -β-alkoxyacrylate is reacted with a hydrazine in an amount of 0.5 to 2.5 moles per mole of said β-anilino-β-alkoxyacrylate to produce a 3-anilino-5-pyrazolone, the improvement comprising carrying out said reaction in the presence of 0.1 to 10 moles per mole of said β-anilino-β-alkoxyacrylate of a compound having a pKa of 8 up to 14, said compound selected from the group consisting of phenol, o-chlorophenol, m-chlorophenol, p-chlorophenol, o-cresol, m-cresol, p-cresol, o-fluorophenol, m-fluorophenol, p-fluorophenol, o-bromophenol, m-bromophenol, p-bromophenol, 2,3-dimethylphenol, 2,4-dimethylphenol, 2,5-dimethylphenol, 2,6-dimethylphenol, 3,4-dimethylphenol, 3,5-dimethylphenol, 2,3,5-trimethylphenol, 2,4,6-trimethylphenol, o-methoxyphenol, m-methoxyphenol, p-methoxyphenol, tertbutylphenol, hydroquinone, catechol, resorcinol, methylhydroquinone, tertbutylhydroquinone, n-octylhydroquinone, 2,5-ditert-butylhydroquinone, naphthol, boric acid and mixtures thereof.

3,979,413

POLYCYCLIC DYESTUFFS

Helmut Seidler, Bonn-Bad Godesberg; Klaus Wunderlich, Leverkusen; Hans-Samuel Bien, Burscheid, and Heinrich Leister, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

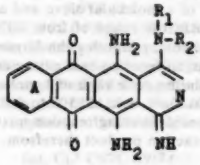
Filed Oct. 17, 1974, Ser. No. 515,470

Claims priority, application Germany, Oct. 26, 1973, 2353700

Int. Cl.² C07D *209/44*

U.S. Cl. 260—326.1 8 Claims

1. A compound of the formula



wherein

R_1 and R_2 are C_1–C_6-alkyl, cyclohexyl, C_1–C_4- alkylcyclohexyl, halocyclohexyl, hydroxycyclohexyl, phenyl-C_1–C_4- alkyl, halophenyl-C_1–C_4-alkyl, C_1–C_4-alklyphenyl-C_1–C_4-alkyl, C_1–C_4-alkoxyphenyl, C_1–C_4-hdroxyalkylphenyl, hydroxyphenyl, or C_1–C_6-alkyl substituted by halogen, hyroxy, cyano, C_1–C_6-alkoxy, —COOH, or C_1–C_4-alkylcarbonyl; and

A is unsubstituted as shown in the above formula or is substituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, or nitro.

3,979,414

DISUBSTITUTED XANTHONE CARBOXYLIC ACID COMPOUNDS

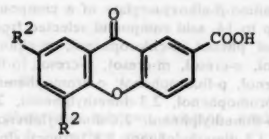
Jurg R. Pfister, Los Altos; Ian T. Harrison, and John H. Fried, both of Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 558,023, March 13, 1975, which is a division of Ser. No. 431,794, Jan. 8, 1974, Pat. No. 3,894,049, which is a continuation-in-part of Ser. No. 259,852, June 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 217,287, Jan. 12, 1972, Pat. No. 3,849,565. This application Dec. 4, 1975, Ser. No. 637,558

Int. Cl.² C07D *311/86*

U.S. Cl. 260—335 5 Claims

1. A compound selected from those represented by the following formula:



and the pharmaceutically acceptable, non-toxic alkyl or glycerol esters, amides, and salts thereof;
wherein
one R^2 group is selected from lower alkyl and the other R_2 group is selected from lower alkanoyl.

3,979,415

METHOD OF PREPARATION OF SULFONATED, DIALKYL-SUBSTITUTED BENZODIOXOLES

David R. McCoy, and Mahmond S. Kablaoui, both of Wappingers Falls, N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 483,598, June 27, 1974, abandoned. This application Apr. 28, 1975, Ser. No. 572,552
Int. Cl.² C07D *317/46*
U.S. Cl. 260—340.5 **9 Claims**

1. A method of preparing a sulfonated ketal of a 1,2-dihydroxybenzene which comprises reacting a 1,2-dihydroxybenzene with an aliphatic ketone containing from 5 to about 30 carbon atoms therein in the presence of phosphorous pentoxide as the acid catalyst and a drying agent selected from the group consisting of a molecular sieve and an acid anhydride at a temperature in the range of from 50° to 150°C., for a period of 1 to 5 hours, extracting the formed ketal from said reaction products, sulfonating said extracted ketal with fuming sulfuric acid in the mole ratio of 1 mole of said ketal to 5 to 10 moles of sulfuric acid at 50° to 150°C., for 1 to 15 minutes, cooling said resulting reaction mixture and recovering the formed reaction product therefrom.

3,979,416

PREPARATION OF AMINOPHTHALIC ANHYDRIDES

Gaetano F. D'Alelio, 2011 E. Cedar St., South Bend, Ind. 46617

Continuation of Ser. No. 370,286, June 15, 1973, abandoned. This application July 25, 1975, Ser. No. 598,929
Int. Cl.² C07D *307/893*
U.S. Cl. 260—346.3 **10 Claims**

1. In the process of preparing aminophthalic anhydride of the formula $H_3NC_8H_nY_{3-n}(CO)_2O$, in which Y represents F, Br or Cl, and *n* represents an integer having a value of 0 to 3, by hydrogenating catalytically a nitrophthalic anhydride $O_3NC_8H_nY_{3-n}(CO)_2O$ at a temperature of about 0°C to about 27°C in a non-reactive water-soluble organic solvent, the improvement for producing high purity, high yield of aminophthalic anhydride comprising the steps of mixing the resultant aminophthalic anhydride solution with water refrigerated to a temperature of about −30° to 20°C, and recovering the precipitated aminophthalic anhydride.

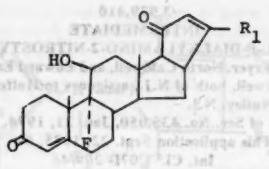
3,979,417

1 H-ANDROSTA(16,17)CYCLOPENTENE-3-ONES

Ravi K. Varma, Belle Mead, and Christopher M. Cimarusti, Hamilton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 7, 1975, Ser. No. 630,121
Int. Cl.² C07J *5/00*
U.S. Cl. 260—397.45 **6 Claims**

1. A steroid having the formula



or a 1,2-dehydro derivative thereof, wherein R_1 is phenyl, naphthyl, or phenyl or naphthyl substituted with one or two alkyl, alkoxy, halogen, or dialkylamino groups.

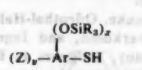
3,979,418

SILOXY SUBSTITUTED ARYLMERCAPTANS

Francis J. Bajer, Depew, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Division of Ser. No. 401,316, Sept. 27, 1973, Pat. No. 3,939,210. This application Nov. 20, 1975, Ser. No. 633,750
Int. Cl.² C07F *7/18*
U.S. Cl. 260—448.8 R **3 Claims**

1. A compound of the structure



wherein Ar is mono, di, tri or poly atomic aryl; each Z is independently selected from the group consisting of hyrocarbon, halogen or hydrogen; R is a monovalent hydrocarbon radical and the sum of X and Y is the total remaining substitutable positions of Ar.

3,979,419

CYANO-ETHER POLYSILOXANE-POLYOXYALKYLENE COPOLYMERS

Bela Prokai, Mahopac, and Bernard Kanner, West Nyack, both of N.Y., assignors to Union Carbide Corp, New York, N.Y.

Filed Dec. 27, 1974, Ser. No. 536,884
Int. Cl.² C07F *7/10, 7/18*
U.S. Cl. 260—448.8 R **39 Claims**

1. Organosilicone compositions which comprise polysiloxane-polyoxyalkylene copolymers containing monofunctional siloxy units and difunctional siloxy units, an average of between about 2 and about 20 silicon-bonded cyano-bearing ether groups for every two moles of monofunctional units, said cyano-bearing ether groups having the formula, $-(O)_q-R'OR''CN$, wherein *q* is zero or one, R' is bivalent alkylene of 3 to 8 carbon atoms and R'' is bivalent alkylene of 2 to 4 carbon atoms, and an average of between about 2 and about 30 silicon-bonded, organic-capped polyoxyalkylene blocks for every two moles of monofunctional units, the polyoxyalkylene content of said copolymers being constituted of at least 75 weight percent of oxyethylene units, said monofunctional units having at least two alkyls bonded to the respective silicon atoms thereof and the difunctional units having at least one alkyl bonded to the respective silicon atoms thereof, the remaining organic group bonded to silicon of the respective monofunctional and difunctional siloxy units being alkyl, said cyanobearing ether group or said polyoxyalkylene block.

3,979,420

CYANO-ETHER POLYSILOXANE-POLYOXYALKYLENE COPOLYMERS

Bela Prokai, Mahopac, and Bernard Kanner, West Nyack, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 27, 1974, Ser. No. 536,885
Int. Cl.² C07F 7/10, 7/18
U.S. Cl. 260—448.8 R 35 Claims

1. Organosilicone compositions which comprise polysiloxane-polyoxyalkylene copolymers containing monofunctional siloxy units, and for every two moles of said monofunctional units, an average of between about 10 and about 200 difunctional dialkylsiloxy units, an average of between about 2 and about 100 silicon-bonded cyano-bearing ether groups having the formula, $-(O)_qR'OR''CN$, wherein q is zero or one, R′ is bivalent alkylene of 3 to 8 carbon atoms and R″ is bivalent alylene of 2 to 4 carbon atoms, and an average of between about 2 and about 30 siliconbonded, organic-capped polyoxyalkylene blocks, the polyoxyalkylene content of said copolymers being constituted of between about 20 and about 65 weight percent of oxyethylene units, said monofunctional siloxy units having at least two alkyls bonded to the respective silicon atoms thereof, the remaining group bonded to the respective silicon atoms of said monofunctional units being alkyl, said cyano-bearing ether group or said polyoxyalkylene block, said copolymers additionally containing difunctional monoalkylsiloxy respective in which the remaining group bonded to the repective silicon atoms thereof is said cyano-bearing group or said polyoxyalkylene block.

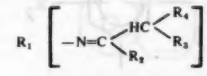
3,979,421

REACTION PRODUCTS CONTAINING FREE ISOCYANATO GROUPS

Wilfried Zecher, Cologne-Stammheim, and Rudolf Merten, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 10, 1968, Ser. No. 728,349
Claims priority, application Germany, May 12, 1967, 52393
Int. Cl. C07c 119/04
U.S. Cl. 260—453 P 4 Claims

1. A process for the preparation of an isocyanato-containing reaction product which comprises reacting at a temperature of from about −30° to about 250°C. in the absence of moisture, a Schiff's base having the formula



wherein R_1 is an n-functional radical and represents C_1 to C_{36} alkyl, C_5 to C_{10} cycloalkyl, up to C_{14} aryl or aralkyl containing up to 3 aryl radicals substituted by C_1 to C_5 alkyl;

R_2 represents C_1 to C_{36} alkyl, C_5 to C_{10} cycloalkyl, up to C_{14} aryl or aralkyl containing up to 3 aryl radicals substituted by C_1 to C_5 alkyl;

R_3 and R_4 represent hydrogen, C_1 to C_{36} alkyl, C_5 to C_{10} cycloalkyl, up to C_{14} aryl or aralkyl containing up to 3 aryl radicals substituted by C_1 to C_5 alkyl;

The radicals R_2 and R_3 may join together to form a 5 to 7 membered cycloaliphatic ring; and

n represents an integer of from 1 to 3;

with from about 1 to about 10 mols per equivalent of Schiff's base of a compound selected from the group consisting of diisocyanates and triisocyanates.

3,979,422

CYCLOALIPHATIC KETONES, PROCESS FOR MAKING SAME AND ODORANT AND FLAVORING COMPOSITIONS CONTAINING SAME

Hanspeter Schenk, Zumikon, and Trudi Sigg-Grütter, Winterthur, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 404,582, Oct. 9, 1973, Pat. No. 3,900,520.
This application May 9, 1975, Ser. No. 575,907
Claims priority, application Switzerland, Oct. 17, 1972, 15189/72
Int. Cl.² C07C 153/07
U.S. Cl. 260—455 R 1 Claim

1. 4-[1,1,3-Trimethyl-3-cyclohexen-2-yl]-2-acetylmercapto-butanone 4.

3,979,423

14-DESOXY-14-TOSYLOXYACETOXY-MUTILIN

Kurt Riedl, Kufstein, Austria, assignor to Biochemie Gesellschaft m.b.H., Vienna, Austria

Division of Ser. No. 261,335, June 9, 1972, abandoned, which is a continuation-in-part of Ser. No. 57,761, July 23, 1970, abandoned. This application Nov. 15, 1973, Ser. No. 416,246
Claims priority, application Austria, July 25, 1969, 7223/69
Int. Cl.² C07C 143/68
U.S. Cl. 260—456 P 1 Claim

1. 14-Desoxy-14-tosyloxyacetoxy-mutilin.

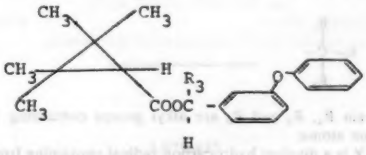
3,979,424

PESTICIDAL CYCLOPROPANE DERIVATIVES

Robert J. G. Searle, Rodmersham Green, near Sittingbourne, and Roger E. Woodall, Borden, near Sittingbourne, both of England, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 15, 1974, Ser. No. 442,992
Claims priority, application United Kingdom, Feb. 16, 1973, 7685/73
Int. Cl.² C07C 69/74
U.S. Cl. 260—468 H 3 Claims

1. A compound of the formula



wherein R_3 is ethynyl or allyl.

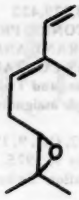
3,979,425

PROCESS FOR THE PREPARATION OF UNSATURATED ALDEHYDES

George Hermann Büchi; Hans Wüest, both of Mattapan, Mass.; Günther Ohloff, Bernex, Geneva, and Hugo Strickler, Onex, Geneva, both of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

Division of Ser. No. 736,267, June 12, 1968. This application Sept. 8, 1975, Ser. No. 611,261
Claims priority, application Switzerland, June 15, 1967, 8529/67; Dec. 14, 1967, 17568/67
Int. Cl.² C07D 303/04
U.S. Cl. 260—348 R 1 Claim

1. A compound selected from the group consisting of cis- and trans-epoxyocimene of the formula



3,979,426

RADIATION-SENSITIVE DIACRYLATES

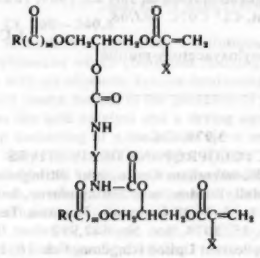
Robert Demajistre, Natrona Heights, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 171,321, Aug. 12, 1971, abandoned. This application Feb. 5, 1973, Ser. No. 329,914

Int. Cl.[2] C07C *125/06*

U.S. Cl. 260—404.5 6 Claims

1. A compound represented by the general formula:



wherein

a. R is selected from the group consisting of n-octyl, isooctyl, 2-ethylhexyl, decyl, dodecyl, tetradecyl, eicosyl and tertiary alkyl of the formula

wherein R_1, R_2 and R_3 are alkyl groups containing 1 to 5 carbon atoms;

b. Y is a divalent hydrocarbon radical containing from 6 to 16 carbon atoms;

c. X is hydrogen or methyl; and

d. *m* is 0 to 1.

3,979,427

CONVERSION OF NITROSO COMPOUNDS TO ISOCYANATES

Gerhard F. Ottmann, Wuppertal-Elberfeld, Germany; David F. Gavin, Cheshire, and Ehernfried H. Kober, Hamden, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jan. 21, 1969, Ser. No. 792,833

Int. Cl.[2] C07C *118/06*

U.S. Cl. 260—453 PC 1 Claim

1. In the process for preparing an aromatic isocyanate by reacting a carbocyclic aromatic nitroso compound with carbon monoxide at an elevated temperature and elevated pressure in the presence of a catalyst, the improvement which comprises employing as said catalyst a mixture of rhodium trichloride and cobalt iodide.

3,979,428

PHENYLACETIC ACIDS

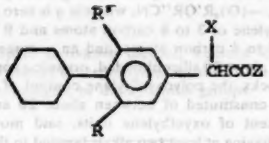
Julius Diamond, Lafayette Hill, and Norman Julian Santora, Roslyn, Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Continuation of Ser. No. 423,542, Dec. 10, 1973, abandoned, which is a division of Ser. No. 152,451, June 11, 1971, Pat. No. 3,821,267, which is a continuation-in-part of Ser. No. 34,870, May 5, 1970, Pat. No. 3,864,384. This application June 24, 1975, Ser. No. 589,748

Int. Cl.[2] C07C *155/02*

U.S. Cl. 260—455 A 5 Claims

1. A compound of the formula



where

R is halo or nitro;

R′ is hydrogen, chloro, bromo, or nitro;

X is carbamylthio, loweralkylcarbamylthio, or diloweralkylcarbamylthio; and

Z is —OH, or

—OM where M is an alkali, alkaline earth or aluminum metal or an ammonium salt.

3,979,429

PARA-AMINO-β-CYANO-BIS-STYRYL COMPOUNDS

Ulrich Zirngibl, Oberwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

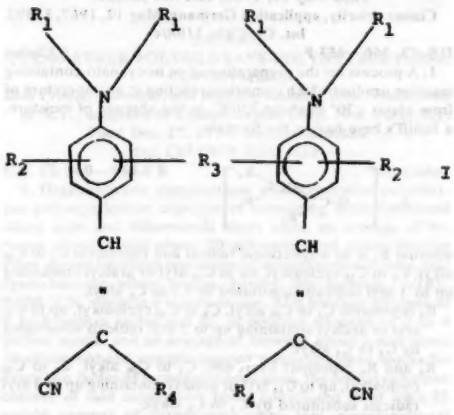
Filed May 8, 1975, Ser. No. 575,617

Claims priority, application Switzerland, May 14, 1974, 6581/74

Int. Cl.[2] C07C *121/78*, *143/68*; C07D *295/00*

U.S. Cl. 260—463 24 Claims

1. A compound of formula I,



in which each

R_1, independently, signifies (C_{1-6}) alkyl which is unsubstituted or monosubstituted by halogen, cyano, hydroxyl, alkoxy, phenyl, phenoxy or acyloxy,

each

R_2, independently, signifies hydrogen, halogen, (C_{1-6}) alkyl or (C_{1-6}) alkoxy,

R_3 signifies a divalent radical of formula $—R_3—R_7—R_5—R_7—R_8—R_7—R_5—R_7—R_5—$ or $R_5—R_7—R_8—R_7—R_5—$ in which R_6 signifies a direct bond or a divalent radical of formula —O—, —S—, $—NR_9—$, —CO—, —O—CO—, —O—CO—O—, $—SO_2—$, $—NR_8—$ —CO—$NR_8—$ or $NR_8—SO_2—NR_8$,

R_4 signifies cyano or acyl,

each

R_5, independently, signifies a divalent radical of formula $—NR_8—CO—$, $—NR_8—CO—O—$, $—O—SO_2—$, $—NR_8—SO_2—$, $—O—SO_3—NR_8—$ or has one of the significances given for R_6, any unsymmetrical divalent radical as R_5 and R_6 being linked either way round,

each

R_7, independently, signifies (C_{1-6}) alkylene or alkylidene, of up to 6 carbon atoms which alkylene and alkylidene radicals are unsubstituted or monosubstituted by halogen, cyano, hydroxyl, (C_{1-6}) alkoxy, phenyl, phenoxy or acyloxy,

each

R_8, independently, signifies hydrogen, (C_{1-6}) alkyl or, when the chain contains any two R_8 attached to nitrogen atoms which are joined by an ethylene radical as R_7, the two symbols R_8, together with the nitrogen atoms and R_7 may join to form a piperazine ring, and

R_9 signifies (C_{1-6}) alkylcarbonyl or (C_{1-6}) alkoxycarbonyl, any acyl group as R_4 or as part of an aryloxy group being of the formula R—Y or R′—Z

in which

R signifies (C_{1-6}) alkyl,

Y signifies —O—CO—, $—SO_3—$ or —O—SO_2—,

R′ signifies hydrogen or (C_{1-6}) alkyl and

Z signifies —CO—, —NR′—CO— or —NR″—SO_3— in which R″ has one of the significances of R′,

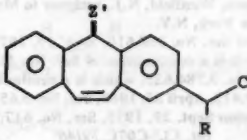
which molecule is free from acetal groups.

3,979,430
SOLVOLYTIC PROCESS FOR THE PREPARATION OF 2-(5H-DIBENZO[a,d] CYCLOHEPTEN-5-ON-2-YL)ACETIC, PROPIONIC AND BUTYRIC ACIDS

Peter H. Nelson; Karl G. Untch, both of Los Altos, and James P. Dunn, Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Sept. 8, 1975, Ser. No. 611,057
Int. Cl.² C07C *121/66*
U.S. Cl. 260—465 K **3 Claims**

1. A compound represented by the formula



wherein R is hydrogen, methyl or ethyl and Z′ is oxo.

3,979,431
PROCESS FOR PREPARING NITROAROMATIC NITRILES

Ralph House, El Sobrante, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sept. 17, 1975, Ser. No. 614,278
Int. Cl.² C07C *121/52, 121/60*
U.S. Cl. 260—465 R **4 Claims**

1. A process for preparing nitroaromatic nitriles which comprises reacting an aromatic carbocyclic nitrile with a nitrating agent comprising from about 20% to about 30% nitric acid and from about 70% to about 80% sulfuric acid at a temperature of at least 35°C and a nitrating agent-to-nitrile molar ratio of at least 3.5:1.

3,979,432
PREPARATION OF NITRILES

Hugh J. Hagemeyer, Jr., and Jerry D. Holmes, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 481,711, June 21, 1974, abandoned. This application Oct. 6, 1975, Ser. No. 620,099
Int. Cl.² C07C *120/08*
U.S. Cl. 260—465.2 **5 Claims**

1. Improved process for the production of an aliphatic nitrile which comprises reacting over a supported catalyst gaseous ammonia with an aliphatic carboxylic acid selected from acetic acid, propionic acid, n-butyric acid, isobutyric acid, pentanoic acid or hexanoic acid at a ratio of ammonia to acid of about 1/1 to 1.15/1.0 to form a product composed of about 40 to 50 percent aliphatic nitrile, about 0.5 to 3 percent ketone, about 6 to 10 percent ammonium carboxylate salt, and the remainder being water, cooling the product to 50°C. and distilling the product at a head temperature at or slightly above the boiling point of the nitrile-water azeotrope to separate the aliphatic nitrile from the other products, the improvement comprising adding a portion of the aliphatic carboxylic acid normally fed directly to the nitrile reactor to the effluent stream from the reactor but before distillation at a ratio in the range of from about 1 mole of said aliphatic carboxylic acid portion to 1 mole ammonium carboxylate to about 4 moles of said aliphatic carboxylic acid portion to 1 mole ammonium carboxylate whereby no additional acid is added to the process and whereby less than 1 percent ammonia based on the ammonium carboxylate fed into the distillation column with the effluent stream escapes from the distillation column and whereby the acid portion fed to the reactor effluent is recycled to the reactor from the distillation system.

3,979,433
1,6-DI-O-(2-ISOCYANO-3-METHYLCROTONYL)-D-MANNITOL COMPOUNDS

Gary G. Marconi, and Marvin M. Hoehn, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed July 18, 1972, Ser. No. 597,112
Int. Cl.² C07C *121/38;* C12D *9/00*
U.S. Cl. 260—465.4 **5 Claims**

1. A 1,6-di-O-(2-isocyano-3-methylcrotonyl)-D-mannitol compound of the formula

wherein all R's are the same and are selected from the group consisting of hydrogen, acetyl, propionyl and butyryl.

3,979,434

BENZOBICYCLOALKANE AMINES

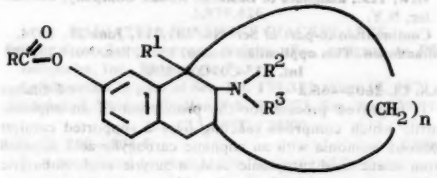
Meier E. Freed, Paoli, and John R. Potoski, Spring City, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 421,375, Dec. 3, 1973, which is a division of Ser. No. 262,849, June 14, 1972, Pat. No. 3,836,670, which is a continuation-in-part of Ser. No. 200,517, Nov. 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 94,983, Dec. 3, 1970, abandoned. This application Feb. 26, 1975, Ser. No. 553,406

Int. Cl.² C07C *93/26*

U.S. Cl. 260—468 H 7 Claims

1. A compound of the formula:



wherein R is alkyl of from 1 to 6 carbon atoms either straight chain, branched or concatenated to form a carbocyclic ring; phenyl; or phenyl substituted by lower alkyl of from 1 to 4 carbon atoms; R^1 is lower alkyl, lower alkenyl, or phen(lower-)alkyl; R^2 is hydrogen, or lower alkyl; R^3 is hydrogen, lower alkyl, alkenyl, or alkynyl; and *n* is an integer of from 2 to 6 and the pharmaceutically non-toxic addition salts thereof.

3,979,435

8β,12α-17-PHENYL-18,19,20-TRINOR-PGF$_{2\alpha}$ COMPOUNDS

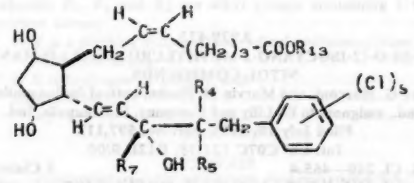
Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 374,405, June 28, 1973, which is a continuation-in-part of Ser. No. 289,317, Sept. 15, 1972, abandoned. This application Oct. 29, 1974, Ser. No. 518,696

Int. Cl.² C07C *65/22*, *65/14*

U.S. Cl. 260—473 A 6 Claims

1. An optically active compound of the formula



wherein

R_4, R_5, and R_7 are hydrogen or methyl, being the same or different;

wherein R_{13} is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; and

wherein s is zero, one, 2, or 3; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_{13} is hydrogen.

3,979,436

OXIDATION RESISTANT POLYMERIC COMPOSITIONS

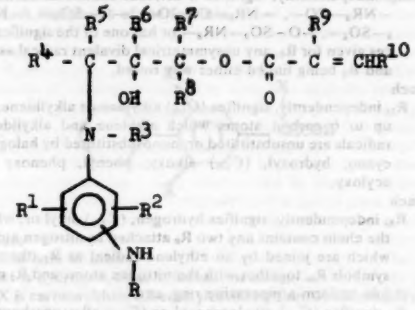
Carl R. Parks, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 153,446, June 15, 1971, Pat. No. 3,817,916. This application Mar. 13, 1974, Ser. No. 450,696

Int. Cl.² C07C *69/54*

U.S. Cl. 260—486 R 6 Claims

1. A composition of matter comprised of at least one compound selected from the group consisting of compounds having the following structural formula:



wherein R is selected from the group consisting of alkyl radicals having 1 to 12 carbon atoms, cycloalkyl radicals having 5 to 12 carbon atoms, aralkyl radicals having 7 to 24 carbon atoms and aryl radicals having 6 to 24 carbon atoms wherein R^1 and R^2 are selected from the group consisting of hydrogen and alkyl groups having 1 to 4 carbon atoms and wherein R^3 is selected from the group consisting of hydrogen, alkyl radicals having 1 to 12 carbon atoms, cycloalkyl radicals having from 5 to 12 carbon atoms, and aralkyl radicals having 7 to 24 carbon atoms, wherein R^4, R^5, R^6, R^7 and R^8 are selected from the group consisting of hydrogen and alkyl radicals having from 1 to 4 carbon atoms, and wherein R^9 and R^{10} are selected from the group consisting of hydrogen and alkyl radicals having from 1 to 4 carbon atoms.

3,979,437

SUBSTITUTED PHENOXYBENZOIC ACIDS AND DERIVATIVES THEREOF

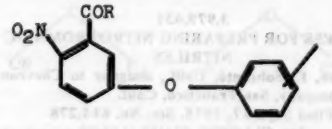
Robert J. Theissen, Westfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 398,610, Sept. 19, 1973, Pat. No. 3,941,830, which is a continuation of Ser. No. 114,712, Feb. 11, 1971, Pat. No. 3,784,635, which is a continuation-in-part of Ser. No. 819,412, April 25, 1969, Pat. No. 3,652,645. This application Sept. 29, 1975, Ser. No. 617,569

Int. Cl.³ C07C *79/46*

U.S. Cl. 260—471 R 2 Claims

1. A compound having the formula:



R is hydroxy, alkoxy of 1 to 4 carbon atoms, or phenoxy; X is halogen or trifluoromethyl and at least one X is halogen and another is trifluoromethyl; and *n* is 2 to 5.

3,979,438

8β,12α-17-PHENYL-18,19,20-TRINOR-PGE$_2$ COMPOUNDS

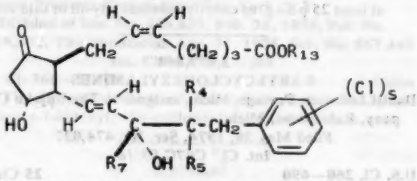
Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 374,405, June 28, 1973, which is a continuation-in-part of Ser. No. 289,317, Sept. 15, 1972, abandoned. This application Oct. 29, 1974, Ser. No. 518,920

Int. Cl.^{2} C07C *65/22, 65/14*

U.S. Cl. 260—473 A 6 Claims

1. An optically active compound of the formula



wherein R_4, R_5, and R_7 are hydrogen or methyl, being the same or different;

wherein R_{13} is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; and

wherein *s* is zero, one, 2, or 3; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_{13} is hydrogen.

3,979,439

8β,12α-17-PHENYL-18,19,20 TRINOR PGF$_{2\beta}$ COMPOUNDS

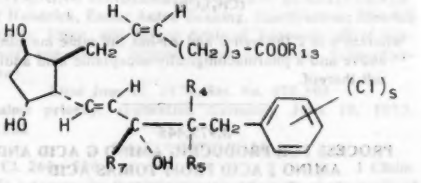
Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 374,405, June 28, 1973, which is a continuation-in-part of Ser. No. 289,317, Sept. 15, 1972, abandoned. This application Oct. 29, 1974, Ser. No. 518,691

Int. Cl.^{2} C07C *65/22, 65/14*

U.S. Cl. 260—473 A 6 Claims

1. An optically active compound of the formula



wherein R_4, R_5, and R_7 are hydrogen or methyl, being the same or different;

wherein R_{13} is hydrogen, alkyl of 1 to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with 1, 2, or 3 chloro or alkyl of 1 to 4 carbon atoms, inclusive; and

wherein *s* is zero, 1, 2, or 3; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_{13} is hydrogen.

3,979,440

PHENACYL-TYPE ESTERS OF PHENYL-SUBSTITUTED PGE-TYPE COMPOUNDS

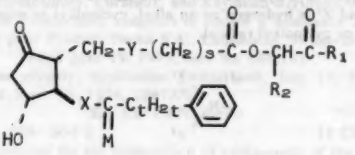
Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 497,244, Aug. 14, 1974. This application Sept. 9, 1975, Ser. No. 611,798

Int. Cl.^{2} C07C *69/76, 69/95*

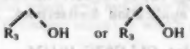
U.S. Cl. 260—473 A 10 Claims

1. An optically active compound of the formula:



wherein the moiety $-C_tH_{2t}-$ represents a valence bond or alkylene of one to 10 carbon atoms, inclusive, with one to 7 carbon atoms, inclusive, between

and the phenyl ring; wherein M is



wherein R_3 is hydrogen or methyl; wherein R_1 is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl; wherein R_2 is hydrogen or benzoyl; and wherein (a) X is $-CH_2CH_2-$ or trans-CH=CH- and Y is $-CH_2CH_2-$, or (b) X is trans-CH=CH- and Y is cis-CH=CH-.

3,979,441

OIL-SOLUBLE POLYMERS OF N-3-AMINOALKYL ACRYLAMIDES, AND LUBRICANTS CONTAINING THEM

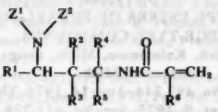
Donald Irvin Hoke, Chagrin Falls, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

Continuation-in-part of Ser. Nos. 237,871, March 24, 1972, Pat. No. 3,856,689, and Ser. No. 203,853, Dec. 1, 1971, Pat. No. 3,883,491, said Ser. No. 237,871, is a continuation-in-part of Ser. No. 832,412, June 11, 1969, Pat. No. 3,666,810, said Ser. No. 203,853, is a division of Ser. No. 832,412,. This application Mar. 27, 1974, Ser. No. 455,162

Int. Cl.^{2} C07C *101/24*

U.S. Cl. 260—482 R 7 Claims

1. An oil-soluble interpolymer comprising (A) at least about 50% by weight of units derived from a polymerizable alkyl ester of an unsaturated acid in which the alkyl group contains at least about 8 carbon atoms, said interpolymer also containing (B) units derived from a monomer of the formula



wherein each of R^1, R^2 and R^3 is hydrogen or a hydrocarbon or substituted hydrocarbon radical; each of R^4 and R^5 is a hydrocarbon or substituted hydrocarbon radical; R^6 is hydrogen or a lower alkyl or substituted lower alkyl radical; Z^1 is hydrogen or a hydrocarbon or substituted hydrocarbon radical and Z^2 is hydrogen or an alkyl, cycloalkyl or substituted alkyl or cycloalkyl radical,

or

is a monocyclic or bicyclic heterocyclic radical in which the only hetero-atoms are nitrogen or nitrogen and oxygen.

3,979,442

DIESTER-AMINE ADDUCTS AND PROCESS FOR THEIR MANUFACTURE

Paul Schafer, Riehen; Jutta Ibrahim, Neuallschwil, and Hanspeter Gysin, Muttenz, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

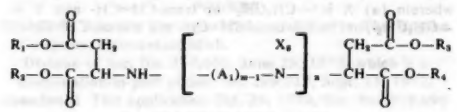
Filed Aug. 15, 1973, Ser. No. 388,525

Claims priority, application Switzerland, Aug. 21, 1972, 12348/72

Int. Cl.² C07C *101/26*

U.S. Cl. 260—482 P **3 Claims**

1. Diester-amine adducts of the formula



wherein

A_1 denotes alkylene with 2 or 3 carbon atoms or 2-hydroxy-n-propylene,

m is 2,

n is an integer from 1 to 4.

R_1, R_2, R_3 and R_4 each denote alkyl or alkenyl with 12 to 22 carbon atoms, and

X_6 denotes hydrogen or alkyl with 1 or 2 carbon atoms, these adducts being in the form of free bases, acid salts or quaternary ammonium salts.

3,979,443

PROCESS FOR THE PREPARATION OF ESTERS OF MALEIC ACID WITH MONOHYDRIC ALCOHOLS

Andrew K. Schwartz, Jr., and Stone D. Cooley, both of Houston, Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Aug. 25, 1972, Ser. No. 283,716

The portion of the term of this patent subsequent to Jan. 21, 1992, has been disclaimed.

Int. Cl.² C07C *69/60*

U.S. Cl. 260—485 R **7 Claims**

1. A process for the preparation of esters of monohydric alcohol with maleic acid which comprises

a. forming maleic anhydride by oxidizing a hydrocarbon which is a precursor of maleic anhydride in a maleic anhydride reactor to form a reactor effluent comprising gaseous maleic anhydride

b. scrubbing said reactor effluent with water to produce an aqueous solution of about 35 to 45 weight percent maleic acid, fumaric acid and at least 40 percent by weight of water

c. in a first stage reacting and dehydrating said aqueous solution of maleic acid and fumaric acid with a primary monohydric alcohol having from 4 to 8 carbon atoms in a distillation column with solvent water being taken off overhead and a mixture comprising diesters and monoesters of maleic acid and esters of fumaric acid and said alcohol being taken off as a bottoms

d. in a second stage reacting the said mixture from step (c) under conditions causing boiling and under a pressure of at least 25 p.s.i.g. to esterify substantially all of said acid.

3,979,444

4-ARYLCYCLOHEXYLAMINES

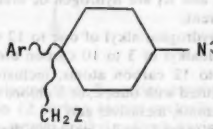
Daniel Lednicer, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed May 28, 1974, Ser. No. 474,037

Int. Cl.² C07C *93/18*

U.S. Cl. 260—490 **25 Claims**

1. A compound of the formula



wherein Ar is an aromatic ring selected from the group consisting of phenyl and naphthyl each of which has from zero through three substituents independently selected from the group consisting of fluorine, chlorine, bromine, lower alkyl of one through three carbon atoms, lower alkoxy of one through three carbon atoms, and lower alkylthio of one through three carbon atoms; Z is selected from the group consisting of hydrogen, hydroxy and loweralkanoyloxy of one through four carbon atoms; ~ is a generic expression denoting cis and trans stereoconfiguration and mixtures thereof, with the proviso that when the stereoconfirguration of the linkage connecting the cyclohexane ring and CH_2Z is cis to the amino group, the linkage connecting the cyclohexane and Ar rings is always trans, and vice versa; R^1 is selected from the group consisting of hydrogen and lower alkyl of one through three carbon atoms; R^2 is

wherein n is 2 through 5 and Ar has the same meaning as above and a pharmacologically acceptable acid addition salt thereof.

3,979,445

PROCESS FOR PRODUCING AMINO G ACID AND AMINO J ACID FROM TOBIAS ACID

Lawrence James Ross, Martinsville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sept. 19, 1975, Ser. No. 615,135

Int. Cl.³ C07C *143/60*

U.S. Cl. 260—508 **5 Claims**

1. A process for the preparation of 2-amino-6,8-naphthalenedisulfonic acid and 2-amino-5,7-naphthalenedisulfonic acid comprising the steps of: (1) heating a solution of 2-amino-1-naphthalenesulfonic acid in 100% sulfuric acid at a temperature of from about 80°C. to about 150°C. to effect rearrangement of the 2-amino-1-naphthalene sulfonic acid to the corresponding 6- or 8-naphthalenesulfonic acid, (2) sulfo-

nating the reaction product from step 1 with sulfur trioxide at a temperature of from about 90°C. to about 150°C. to produce a reaction product comprising 2-amino-6,8-naphthalenedisulfonic acid and 2-amino-1,5,7-naphthalenetrisulfonic acid and (3) hydrolyzing the reaction product of step 2 to convert the 2-amino-1,5,7-naphthalenetrisulfonic acid to 2-amino-5,7-naphthalenedisulfonic acid.

3,979,446

PROSTAGLANDIN INTERMEDIATE

Donald P. Strike, St. Davids; Wenling Kao, Devon, and Richard L. Fenichel, Wyncote, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 446,835, Feb. 28, 1974, Pat. No. 3,919,302. This application Apr. 11, 1975, Ser. No. 567,449

Int. Cl.² C07C *177/00*

U.S. Cl. 260—514 D **1 Claim**

1. The compound which is 7-[5α-hydroxy-3α-methyl-2β-(3-oxo-trans-1-octenyl) -1α-cyclopentyl]-cis-5-heptenoic acid.

3,979,447

γ-GLUTAMYL-4-NITROANILIDE COMPOUNDS

Erich Bernt, Munich; Wolfgang Gruber, Garatshausen; Erich Haid; Fritz Stahler, both of Tutzing; August Wilhelm Wahlefeld, Weilheim, and Gunter Weimann, Tutzing, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

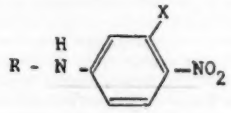
Filed Nov. 27, 1973, Ser. No. 419,455

Claims priority, application Germany, Dec. 5, 1972, 2259512; July 3, 1973, 2333798

Int. Cl.² C07C *103/50*

U.S. Cl. 260—518 R **8 Claims**

1. γ-Glutamyl-4-nitroanilide compound of the formula



wherein R is a γ-glutamyl radical and X is carboxyl or carboxyalhyl containing up to 6 carbon atoms; and alkali, alkaline earth, and ammonium salts thereof.

3,979,448

PROCESSES FOR THE CONTINUOUS PRODUCTION OF AROMATIC CARBOXYLIC ACIDS BY OXIDATION WITH NITRIC ACID OF AROMATIC COMPOUNDS CONTAINING OXIDIZABLE ACYCLIC SUBSTITUENTS

Kurt Handrick, Essen; Anton Benning, Saarbrucken; Dietrich George, Essen, and Jürgen Schlegel, Iddensen, all of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Filed June 11, 1974, Ser. No. 478,395

Claims priority, application Germany, June 19, 1973, 2331082

Int. Cl.² C07C *51/33*

U.S. Cl. 260—524 N **1 Claim**

1. In a process for the continuous production of pyromellitic acid by reaction of durene with nitric acid, the improvement which comprises passing a reaction mixture consisting of durene and nitric acid having a concentration between 10 and 11% by weight of nitric acid through a series of seven consecutively interconnected vertical reactor columns in each of which the ratio of the weight of the reaction mixture containing the dilute nitric acid to the weight of durene is continuously maintained at at least 50:1, the nitric acid concentration in each of the reactor columns is maintained at the originally preselected concentration by the addition of amounts of more-concentrated nitric acid thereto while aliquot portions of durene are continuously introduced into each of the reactor columns to maintain the preselected ratio of nitric acid to durene, the first six of the said reactor columns being maintained at a temperature of 170°C and the final seventh column being maintained at a temperature of 200°C, and continuously discharging the reaction mixture containing between 10 and 20% by weight of pyromellitic acid thus produced from the final reactor column.

3,979,449

PREPARATION OF AN ASPARAGINE OR A GLUTAMINE

Pierre Hirsbrunner, Corseaux, and Raymond Bertholet, Aigle, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausaunne, Switzerland

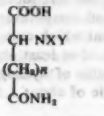
Filed June 19, 1975, Ser. No. 588,181

Claims priority, application Switzerland, July 11, 1974, 9572/74; Sept. 18, 1974, 12673/74

Int. Cl.² C07C *99/00*

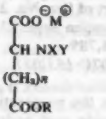
U.S. Cl. 260—534 E **11 Claims**

1. A process for the preparation of compounds of the general formula



(I)

(in which *n* is an integer equal to 1 or 2 and X and Y which may be the same or different are hydrogen atoms or organic groups, except that when *n*=2 not more than one of X and Y may represent a hydrogen atom) in which a compound of the general formula



(II)

(in which $M^{\oplus}$ represents a cation, R represents an aliphatic group containing 1 to 3 carbon atoms and X, Y and *n* have the meanings given above) is reacted with ammonia in an aqueous medium and thereafter the compound of formula (I) is liberated by acidification of the reaction medium.

3,979,450

METHOD FOR PREPARING DICARBOXYLIC ACIDS

Jury Leonidovich Moskovich, Moskovsky prospekt, 1, kv. 14; Jury Nikolaevich Juriev, Liteiny prospekt, 46, kv. 17; Viktor Karlovich Tsyskovsky, Kanal Griboedova, 22, kv. 6; Ljudmila Vasilievna Berezova, prospekt Obukhovskoi Oborony, 104, kv. 7; Nokhum Davidovich Gilchenok, ulitsa Ordzhonikidze 11/39, kv. 50, all of Leningrad; Vladimir Avgustovich Yanshevsky, ulitsa Kommunisticheskaya, 7, kv. 28, Novokuibyshevsk; Dmitry Vasilievich Mushenko, Bolzheokhtinsky prospekt, 10, kv. 18, Leningrad; Evgeny Semenovich Zelikman, Novo-Litovskaya ulitsa, 5, Kv. 116, Leningrad; Rufina Alexandrovna Filippova, ulitsa, Uspenskogo, 3, Kv. 19, Novokuibyshevsk; Vladimir Leonidovich Klimenko, ulitsa, Lomonosova, 12, Kv. 29, Leningrad, and Valerian Mikhailovich Sobolev, naberezhnaya Maxima Gorkogo, 46-50, kv. 185, Moscow, all of U.S.S.R.

Filed Feb. 8, 1973, Ser. No. 330,637

Int. Cl.² C07C *51/26*

U.S. Cl. 260—537 P **11 Claims**

1. A method for preparing dicarboxylic acids, comprising ozonolyzing a cycloolefin reactant with ozonized air in a lower alkanoic acid medium at a temperature of from 20° to 40°C to form an ozonolyzate; treating the ozonolyzate with an aqueous solution of hydrogen peroxide having a concentration of from 20 to 30 percent of said hydrogen peroxide; passing the ob-

tained mixture through a solid acid catalyst which is a cation exchange resin having a polystyrene matrix cross-linked wih divinylbenzene and containing sulfonic acid groups, said cation exchange resin being in the H-form at a temperature of from 30° to 60°C at a space velocity of from 2 to 4 hours^{-1}; heat-treating the cartalyzed product to a temperature of from 50° to 80°C and at a space velocity of from 0.3 to 0.5 hour^{-1}; and thermally degrading the heat-treated catalyzed product at a temperature of from 90° to 110°C.

3,979,451

PROCESS FOR THE PRODUCTION OF THIOPHOSGENE

Gerhard Meyer; Helmut Magerlein, both of Obernburg, and Hans-Dieter Rupp, Kassel-Bettenhausen, all of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed May 22, 1974, Ser. No. 472,090

Claims priority, application Germany, May 24, 1973, 2326396

Int. Cl.² C07C *145/00*

U.S. Cl. 260—543 H 5 Claims

1. In a process for the production of thiophosgene wherein trichloromethanesulfenyl chloride is reduced by reaction with hydrogen sulfide at an elevated temperature and in contact with silica gel, the improvement which comprises conduction the reaction at a temperature of at least about 110°C. up to about 150°C. with a molar ratio of hydrogen sulfide to trichloromethanesulfenyl chloride of about 1.5:1. to 4:1.

3,979,452

THIOFORMAMIDE IMPROVED PROCESS

Eugene H. Axelrod, Old Bridge, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 384,544, Aug. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 210,222, Dec. 20, 1971, abandoned. This application Sept. 23, 1974, Ser. No. 508,789

Int. Cl.² C07C *153/057*

U.S. Cl. 260—551 S 6 Claims

1. An improved process for the preparation of thioformamide wherein hydrogen cyanide and hydrogen sulfide are combined in the presence of a basic catalyst, the improvement comprising employing an insoluble tertiary amine anion exchange resin in an organic solvent at from −40° to 100°C. as a catalyst for the reaction.

3,979,453

3-CYANAMINO-2,6-DINITROANILINES

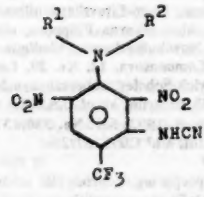
Joseph A. Yahner, New Palestine, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed June 23, 1975, Ser. No. 589,313

Int. Cl.² C07C *125/08*

U.S. Cl. 260—551 C 6 Claims

1. A compound of the formula:



wherein

R^1 is hydrogen C_1–C_4 nontertiary alkyl, C_3–C_4 alkenyl, chloro C_3–C_3 alkyl, chloro C_3–C_4 alkenyl or cyclopropylmethyl; and

R^2 is C_1–C_7 nontertiary alkyl, C_3–C_4 alkenyl, chloro C_3–C_3 alkyl, chloro C_3–C_4 alkenyl or cyclopropylmethyl;

and the triethylamine, pyridine and alkali metal salts thereof.

3,979,454

PROCESS FOR THE PRODUCTION OF ALKYL SULPHONIC ACID HYDROXY ALKYL AMIDES

Hermann Perrey; Harry Welz; Ralf Lange; Hans Rudolph, and Hans Jürgen Rosenkranz, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 17, 1975, Ser. No. 559,283

Claims priority, application Germany, Mar. 29, 1974, 2415330

Int. Cl.² C07C *143/74*

U.S. Cl. 260—556 A 10 Claims

1. In the known process for the production of alkyl sulphonic acid hydroxy alkyl amides by reacting alkyl sulphonic acid chlorides and hydroxy alkyl amines in the presence of acid binding agents the improvement comprising using an aqueous alkali hydroxide solution as acid-binding agent, applying the three components in such a ratio, that 0.8 to 1.2 moles of alkali hydroxide and 1 to 1.3 moles of hydroxy alkyl amine are used per mole of sulphonic acid chloride, and carrying out the reaction by adding the alkyl sulphonic acid chloride to the hydroxy alkyl amine and adding to the mixture thus obtained the aqueous alkali hydroxide solution at such a rate that the pH-value of the reaction mixture does not exceed pH 10.

3,979,455

PREPARATION OF DIOXYIMINO-CYCLOALKANONES AND RELATED INTERMEDIATES

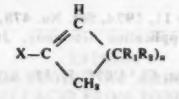
Roger G. Duranleau, Ardonia, N.Y., and Dennis R. Taylor, Temple City, Calif., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 13, 1974, Ser. No. 532,358

Int. Cl.² C07C *131/02*

U.S. Cl. 260—566 A 9 Claims

1. A process of producing a 2,6-dioximino-1-cycloalkanone product by reacting an enamine corresponding to the formula:



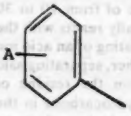
wherein X is a secondary amino radical selected from the group consisting of morpholino, N-alkyl anilino wherein said alkyl radicals contain from 1 to 6 carbon atoms, pyrrolidino; piperidino and pyrazolino; each of R_1 and R_2 is hydrogen or lower alkyl radical containing from 1 to 6 carbon atoms, and n is an integer of from 2 to 15 carbon atoms; with nitrosyl chloride in an inert organic solvent selected from the group consisting of chloroform and alkanols containing 1 to 4 carbon atoms, until a 2,6-dioxininocycloalkylidene-containing quaternary ammonium adduct of said amine is formed and hydrolyzing said adduct to the desired 2,6-dioximino-1-cycloalkanone.

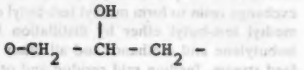
3,979,456
PHENOXYALKYLAMINES, PROCESS FOR THEIR PREPARATION AND APPLICATIONS THEREOF

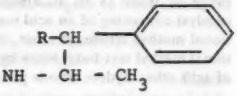
Henri Pinhas, Paris, France, assignor to Laboratoires Laroche Navarron, Levallois, France

Division of Ser. No. 210,107, Dec. 20, 1971, Pat. No. 3,873,620. This application Jan. 20, 1975, Ser. No. 542,227
Claims priority, application France, Dec. 28, 1970, 70.46875
Int. Cl.² C07C *93/06*
U.S. Cl. 260—570.7 3 Claims

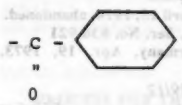
1. A compound selected from the group consisting of phenoxyalkylamines of formula:



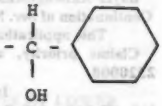




in which R is selected from the group consisting of hydrogen and hydroxy and A is selected from the group consisting of the radicals



and



and their non-toxic acid addition salts.

3,979,457
PROCESS FOR PRODUCTION OF (+)-2-AMINO-1-BUTANOL

Chiyuki Fujii; Moroshi Yasui, and Yoshiaki Ishimathu, all of Machida, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 30, 1974, Ser. No. 510,194
Claims priority, application Japan, Sept. 28, 1973, 48-108975
Int. Cl.² C07C *89/00, 91/02*
U.S. Cl. 260—584 R 13 Claims

1. A process for producing (+)-2-amino-1-butanol which comprises

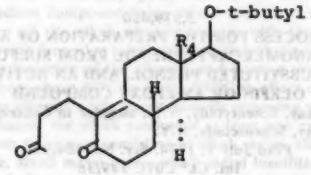
1. optically resolving an N-acyl-DL-2-aminobutyric acid in an aqueous solution using the action of an acylase to obtain (A) an aqueous solution predominantly comprising L-2-aminobutyric acid and a small amount of an N-acyl-D-2-aminobutyric acid and (B) an aqueous solution predominantly comprising an N-acyl-D-2-aminobutyric acid and a small amount of L-2-aminobutyric acid,
2. isolating crystalline L-2-aminobutyric acid from said solution (A) and to obtain a solution (C) from which said L-2-aminobutyric acid has been isolated,
3. esterifying said crystalline L-2-aminobutyric acid to form an L-2-aminobutyric acid ester,
4. reducing the L-2-aminobutyric acid ester to form (+)-2-amino-1-butanol, said reducing occurring in the presence of Raney nickel in an amount higher than about 50% by weight or platinum in an amount higher than about 10% by weight based on the amount of said L-2-aminobutyric acid ester at temperatures of ambient temperature to about 70°C and a hydrogen pressure below about 70 Kg/cm²
5. combining said solution (B) and said solution (C) to form a solution (D),
6. crystallizing said N-acyl-D-2-aminobutyric acid from said solution (D) to obtain crystals comprising predominantly said N-acyl-D-2-aminobutyric acid and a small amount of said L-2-aminobutyric acid, and
7. racemizing said crystals comprising predominantly said N-acyl-D-2-aminobutyric acid to obtain an N-acyl-DL-2-aminobutyric acid for recycle to step (1).

3,979,458
PRODUCTION OF UNSATURATED CARBOCYCLIC KETONES

John H. Fried, Palo Alto, Calif., assignor to Syntex Corporation, Panama, Panama

Division of Ser. No. 747,465, July 25, 1968, Pat. No. 3,880,884, which is a continuation-in-part of Ser. No. 687,502, Dec. 4, 1967, Pat. No. 3,639,428. This application Jan. 10, 1975, Ser. No. 540,015
Int. Cl.² C07C *49/00*
U.S. Cl. 260—586 E 1 Claim

1. A compound of the formula



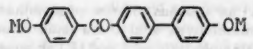
wherein R_4 is lower alkyl having from 1 to 6 carbon atoms.

3,979,459
SUBSTITUTED 4-PHENYL BENZOPHENONES

John Brewster Rose, Letchworth, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 7, 1974, Ser. No. 467,797
Claims priority, application United Kingdom, May 25, 1973, 25203/73; Mar. 14, 1974, 11442/74
Int. Cl.³ C07C *49/80, 49/82*
U.S. Cl. 260—591 3 Claims

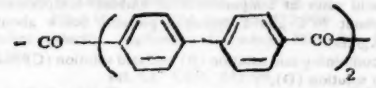
1. A compound of the formula



where M is hydrogen or alkali metal.

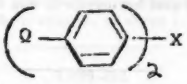
2. A compound of the formula

where X is a group having the formula

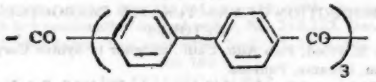


and Q is a fluorine, chlorine or bromine atom, a hydroxyl group or alkali metal salt thereof and may be the same or different.

3. A compound of the formula



where X is a group having the formula



and Q is a fluorine, chlorine or bromine atom, a hydroxyl group or alkali metal salt thereof and may be the same or different.

3,979,460

PROCESS FOR THE PREPARATION OF AN ORGANOMERCAPTOPHENOL FROM SULFUR, A 2,6-DISUBSTITUTED PHENOL, AND AN ACTIVATED OLEFIN OR AN EPOXY COMPOUND

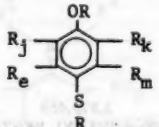
Allan S. Hay, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed July 1, 1974, Ser. No. 484,996

Int. Cl.[2] C07C *149/36*

U.S. Cl. 260—609 F **10 Claims**

1. A composition of matter comprising an organomercaptophenol of the formula



wherein independently each R_j and R_k is a monovalent substituent selected from the group consisting of hydrocarbon and hydrocarbonoxy radicals, each R_e and R_m is a monovalent substituent selected from the group consisting of hydrogen, hydrocarbon and hydrocarbonoxy radicals, and R_z is a hydroxy substituted monovalent acyclic or cyclic hydrocarbon radical, and R is selected from hydrogen and R_z radicals.

3,979,461

PROCESS FOR THE PREPARATION OF METHYL TERT-BUTYL ETHER

Francesco Anciliotti, San Donato Milanese; Gianni Oriani, and Ermanno Pescarollo, both of Milan, all of Italy, assignors to Sham Progetti S.p.A., San Donato Milanese, Italy

Filed May 21, 1975, Ser. No. 579,692

Claims priority, application Italy, May 21, 1974, 23009/74

Int. Cl.[2] C07C *41/06, 41/10*

U.S. Cl. 260—614 A **2 Claims**

1. In a process of preparing methyl tert-butyl ether by reacting isobutylene with methanol, the improvement which comprises carrying out said reaction in two stages by feeding a hydrocarbon stream containing isobutylene and methanol to a primary reaction zone at a temperature in the range of from 50° to 90°C and at a pressure in the range of from 10 to 30 atmospheres wherein the isobutylene partially reacts with the methanol in the presence of a catalyst consisting of an acid ion exchange resin to form methyl tert-butyl ether, separating said methyl tert-butyl ether by distillation from the residue of isobutylene and methanol and all other hydrocarbons in the feed stream, feeding said residue and other hydrocarbons to a secondary reaction zone where the residue of isobutylene and methanol are caused to react in the liquid phase in the temperature range of from 60° to 100°C and in the pressure range of from 15 to 40 atmospheres in the presence of a catalyst consisting of an acid ion exchange resin to form additional methyl tert-butyl ether, and then recovering said additional methyl tert-butyl ether by distillation to leave a balance of said other hydrocarbons practically free from isobutylene.

3,979,462

CONDENSATION RESINS OF PHENOLS AND α,α′-DIHYDROXY-DIISOPROPYL BENZENES

Heinrich Krimm; Hans-Josef Buysch, both of Krefeld-Bockum, and Dieter Freitag, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Continuation of Ser. No. 461,092, April 15, 1974, abandoned. This application Dec. 2, 1975, Ser. No. 636,921

Claims priority, application Germany, Apr. 19, 1973, 2320008

Int. Cl.[2] C07C *39/12*

U.S. Cl. 260—619 B **5 Claims**

1. A product produced by the process which comprises reacting phenol with a mixture of α,α′-dihydroxy-m-diisopropyl benzene and α,α′-dihydroxy-p-diisopropyl benzene, said dihydroxy compounds being in a molar ratio of between 7:3 and 3:7, in the presence of a catalytic amount of an acid catalyst selected from the group consisting of phosphoric acid, o-phosphoric acid, m-phosphoric acid, pyrophosphoric acid, phosphorous acid and hypophosphorous acid at a temperature of between about 70 and 270°C.

3,979,463

FLUOROALIPHATIC PHENOLS

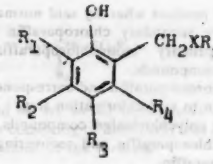
Leland S. Endres, San Luis Obispo, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 84,508, Oct. 27, 1970, abandoned. This application Mar. 18, 1974, Ser. No. 451,920

Int. Cl.[2] C07C *39/26*

U.S. Cl. 260—623 D **7 Claims**

1. A compound having the formula



wherein X is $-CHClCH_2-$, $-CH=CH-$, or $-CH_2-CH_2-$; R_f is a perfluoroalkyl having from 3 to 20 carbon atoms; R_1, R_2, R_3, and R_4 are selected from the class consisting of methyl, ethyl, methoxy, phenyl, phenoxy, hydrogen, and halogen and R_1 and R_3 can be $-CH_2XR_f$.

3,979,464

METHYLATION OF 2,6-XYLENOL TO PRODUCE 2,3,6-TRIMETHYLPHENOL

Bruce E. Leach, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Aug. 25, 1975, Ser. No. 607,732
Int. Cl.² C07C *39/06*
U.S. Cl. 260—621 R **8 Claims**

1. In a process for the liquid phase methylation of 2,6-xylenol to form 2,3,6-trimethylphenol in contact with alumina catalysts, the improvement comprising:
   a. contacting 2,6-xylenol with methanol in liquid phase,
   b. at a temperature of from about 300°C to about 390°C,
   c. at a pressure at from about 350 psig to about 500 psig,
   d. at a liquid hourly space velocity of from about 1 to about 15 while in contact with an alumina catalyst derived from aluminum alkoxide hydrolysis.

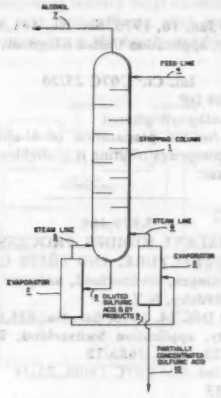
3,979,465

PROCESS FOR THE PRODUCTION OF LOWER ALIPHATIC ALCOHOLS

Günter Strehlke, Rheinkamp-Baerl, and Günther Osterburg, Homberg, both of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed Jan. 7, 1974, Ser. No. 431,177
Claims priority, application Germany, Jan. 13, 1973, 2301632
Int. Cl.² C07C *29/06*
U.S. Cl. 260—639 R **7 Claims**

1. A process for the production of a lower aliphatic alcohol comprising reacting an olefin having from 2 to 4 carbon atoms with sulfuric acid of a concentration greater than 70 percent in a reaction vessel to form an ester reaction product, adding water to said product to form a dilute ester reaction product and promote hydrolysis, steam stripping said dilute ester reaction product in a stripping column to remove a lower aliphatic alcohol overhead leaving a dilute sulfuric acid solution containing less than about 45 percent sulfuric acid, concentrating said dilute sulfuric acid solution in a first stage evaporator employing indirect heat exchange means to an intermediate solution containing from about 55 to 65 percent sulfuric acid, recycling the steam generated in the first stage evaporator to said steam stripping step, further concentrating said intermediate sulfuric acid solution in a second stage direct heat evaporator employing an immersion-burner to form a concentrated sulfuric acid solution containing at least 70 percent sulfuric



acid and recycling said concentrated sulfuric acid solution to said reaction vessel.

3,979,466

PROCESS FOR CONDENSATION OF ALCOHOLS

James E. Yates, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 367,689, June 6, 1973, Pat. No. 3,860,664. This application Sept. 19, 1974, Ser. No. 507,304
Int. Cl.² C07C *29/00*
U.S. Cl. 260—642 C **5 Claims**

1. A process for producing higher molecular weight hydrocarbon alcohols by forming a reaction mixture comprised of at least one lower molecular weight alkanol having a methylene group adjacent the hydroxylated carbon atom, an alkali catalyst and a catalytic amount of a palladium (II) alkyl carboxylate wherein the alkyl group has 1 to 17 carbon atoms, said palladium compound being mixed with alkanol prior to dissolution of the alkali catalyst therein with the reaction mixture being formed at temperatures below that necessary to effect condensation of the alkanol, and heating the reaction mixture from about 80°C to about 300°C to effect condensation of the alkanol, while simultaneously removing water as it forms, wherein the alkali catalyst is at least one catalyst selected from the group consisting of alkali metal, alkali metal hydroxide, alkali metal oxide, alkali metal bisulfite or alkali metal alcoholate.

3,979,467

PROCESS FOR THE NITRATION OF HALOAROMATICS

Ignatius Schumacher, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed May 9, 1973, Ser. No. 358,566
Int. Cl.² C07C *79/12*
U.S. Cl. 260—646 **8 Claims**

1. In a process for the preparation of a nitro- and halo-substituted aromatic compound wherein a halogenated aromatic compound is contacted with a nitrating agent, the improvement which comprises carrying out the nitration in the presence of a phosphorus compound, the phosphorus compound being present in an amount sufficient to produce an ortho-directive effect.

3,979,468
4'-CHLORO-4-ETHYNYLBIPHENYL AND METHOD OF PREPARING SAME

Colin Frederick Webb, and Barry John Price, both of London, England, assignors to Allen & Hanburys Limited, London, England

Filed Jan. 16, 1975, Ser. No. 541,393
Claims priority, application United Kingdom, Jan. 31, 1974, 4531/74
Int. Cl.² C07C *25/26*
U.S. Cl. 260—649 DP **3 Claims**

1. 4'-chloro-4-ethynylbiphenyl.

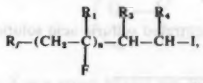
2. A process for the preparation of 4'-chloro-4-ethynylbiphenyl which comprises treating β,4'-dichloro-4-biphenylacrolein with a base.

3,979,469
POLYFLUOROALKYL IODIDES, PROCESS FOR THEIR MANUFACTURE, AND THEIR USE

Horst Jäger, Bettingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 14, 1973, Ser. No. 425,011
Claims priority, application Switzerland, Dec. 21, 1972, 18662/72; Feb. 23, 1973, 2653/73
Int. Cl.² C07C *19/08, 25/14*
U.S. Cl. 260—653 **8 Claims**

1. Polyfluoroalkyl iodides of the formula

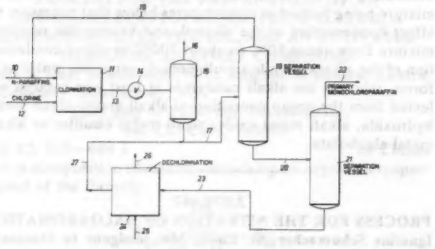


wherein R_f represents fluorinated alkyl of 3 to 18 carbon atoms, R_1 represents hydrogen or fluorine, R_3 and R_4 each independently represents hydrogen, alkyl with 1 to 4 carbon atoms and n is a whole number from 1 to 3.

3,979,470
PROCESS FOR THE PRODUCTION OF PRIMARY NORMAL MONOCHLOROPARAFFINS

Bernhard E. Firnhaber, Somerville; Robert E. Chute, Clinton, both of N.J., and Brian H. Carter, Helsby, England, assignors to Pullman Incorporated, Chicago, Ill.

Filed Sept. 24, 1973, Ser. No. 400,459
Int. Cl.² C07C *17/02*
U.S. Cl. 260—658 R **7 Claims**



1. A process for the production of primary normal monochloroparaffins from a C_9 to C_{15} normal paraffin which comprises:

chlorinating said normal paraffin and the corresponding secondary chloroparaffin using a free-radical mechanism and conditions to optimize the substitution in the primary position of said paraffins to form a product containing unreacted normal paraffin, primary monochloroparaffin, secondary chloroparaffin and polychlorinated compounds;

separating said product whereby said normal paraffin and corresponding secondary chloroparaffin are separated from the primary monochloroparaffin and polychlorinated compounds;

recycling said normal paraffin and corresponding secondary chloroparaffin to said chlorination step;

separating said polychlorinated compounds from said primary monochloroparaffin and recovering said primary monochloroparaffin;

dechlorinating said polychlorinated compounds with hydrogen in the presence of a noble metal at temperatures of 250° to 500°F. and pressures of 25 to 75 atmospheres to convert said polychlorinated compounds to paraffin, primary monochloroparaffin, secondary monochlorparaffin and hydrogen chloride;

separating said hydrogen chloride from said mixture of paraffin, primary normal monochloroparaffin and secondary monochlorparaffin; and

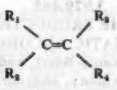
combining said mixture with said product formed in said chlorinating step prior to separation of said product whereby the primary normal monochloroparaffin may be recovered.

3,979,471
PROCESS FOR SYNTHESIZING ETHYLENIC COMPOUNDS

Marc Julia, Paris, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Aug. 2, 1974, Ser. No. 494,430
Claims priority, application France, Aug. 10, 1973, 73.29329
Int. Cl.² C07C *1/22, 1/24*
U.S. Cl. 260—666 A **11 Claims**

1. A process for preparing ethylenic compounds with the formula:



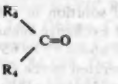
wherein:

R_1 and R_2 are selected from the group consisting of hydrogen and CH_3;

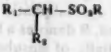
R_3 is selected from the group consisting of hydrogen, aromatic hydrocarbon radical, and a saturated or unsaturated, linear or branched aliphatic hydrocarbon;

R_4 is selected from the group consisting of phenyl and a saturated or unsaturated linear or branched aliphatic hydrocarbon, where R_3 and R_4 may be joined to form a ring structure;

which comprises the steps of reacting in the presence of a basic agent selected from the oxides, hydroxides, amides, hydrides and alcoholates of an alkali metal


(A)

wherein R_3 and R_4 are as set forth above and



(B)

wherein R_1 and R_2 are as set forth above and R is selected from the group consisting of alkyl, aryl and cycloalkyl to form an alcohol sulphone of the formula:

(C)

which sulphone is treated with an alkali metal amalgam reducing agent.

3,979,472

PROCESS FOR MANUFACTURING HYDROCARBONS

Stephen A. Butter, East Windsor, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 28, 1975, Ser. No. 563,241

Int. Cl.² C07C *1/20*

U.S. Cl. 260—668 R **11 Claims**

1. A process for producing hydrocarbons which comprises: contacting, under conversion conditions, a feed consisting essentially of one or more lower monohydric alcohol having up to four carbon atoms, the ethers derived therefrom, or mixtures of said alcohols and ethers, with a catalyst comprising an intimate admixture of an oxide of antimony and a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 12 and a constraint index from 1 to 12, said antimony oxide constituting at least 1% by weight of said admixture, whereby is formed a mixture comprising light olefins, monocyclic aromatic hydrocarbons, and water; and, recovering said hydrocarbons.

3,979,473

PROCESS FOR THE COLOR STABILIZATION OF INDENE

George S. Li, Aurora, and Gerald P. Coffey, Cleveland Heights, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Dec. 23, 1974, Ser. No. 535,490

Int. Cl.² C07C *7/18*

U.S. Cl. 260—674 R **4 Claims**

1. A process for the stabilization of indene against color formation consisting of adding to the indene an insoluble solid stabilizer selected from the group consisting of aluminum sulfate and zinc chloride in a concentration from about 0.001 to 2.5 percent by weight based on indene, and subsequently separating the stabilizer from the stabilized product.

3,979,474

PROCESS FOR SEPARATING ISOBUTYLENE FROM C_4 HYDROCARBON MIXTURES

Willy Zerrweck, Marl, Germany, assignor to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed Dec. 13, 1974, Ser. No. 532,674

Claims priority, application Germany, Dec. 14, 1973, 2362115

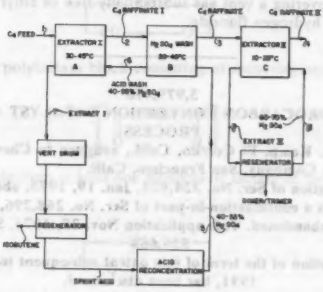
Int. Cl.² C07C *11/08*

U.S. Cl. 260—677 S **9 Claims**

1. In the process of selectively extracting isobutylene from a hydrocarbon mixture of C_4 hydrocarbons comprising olefins and paraffins in addition to said isobutylene by reacting said hydrocarbon mixture with a first aqueous solution of sulfuric acid to convert said isobutylene to tertiary butyl alcohol soluble in said first aqueous solution, separating said first aqueous solution from a raffinate comprising the remaining hydrocarbon mixture and entrained tertiary butyl alcohol and regenerating said tertiary butyl alcohol in said first aqueous solution to isobutylene, the improvement comprising:

a. extracting said hydrocarbon mixture in a first stage at a temperature between about 30° and 45°C with said first aqueous solution having about 40 – 55 percent by weight sulfuric acid and separating a first raffinate and a first extract comprising tertiary butyl alcohol; and

b. extracting said first raffinate after separating the entrained tertiary butyl alcohol by washing with aqueous



sulfuric acid at a temperature between 20° and 40°C in a second stage at a temperature between 10° and 25°C with a second aqueous solution having about 60 – 70 percent by weight sulfuric acid and separating a second raffinate comprising remaining hydrocarbon substantially free of isobutylene and a second extract which is regenerated to recover dimers and trimers of isobutylene.

3,979,475

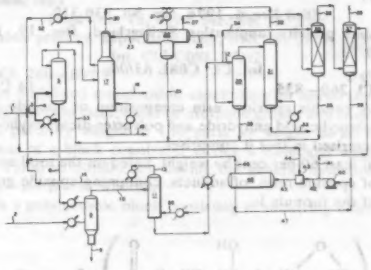
RECOVERY OF HF AND ETHYL FLUORIDE FROM ALKYLATION OF ISOPARAFFIN WITH OLEFINS IN PRESENCE OF HF CATALYST

Cecil O. Carter, Wann, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 10, 1974, Ser. No. 531,490

Int. Cl.² C07C *3/54*

U.S. Cl. 260—683.42 **4 Claims**



1. In the alkylation of an isoparaffin and an olefin in the presence of a catalyst and ethyl fluoride thereby obtaining an alkylate stream which is fractionated to produce an overhead comprising propane and ethyl fluoride, the method of:

1. condensing said overhead thereby obtaining:

a. a liquid stream comprising propane and ethyl fluoride, and

b. a vent gas stream comprising propane and ethyl fluoride;

2. contacting said liquid stream with a first lean hydrogen fluoride stream thereby removing ethyl fluoride into the hydrogen fluoride;

3. recovering propane substantially free of ethyl fluoride from said liquid stream;
4. contacting said vent gas with a second lean hydrogen fluoride stream thereby removing ethyl fluoride into the hydrogen fluoride;
5. further treating the vent gas from step (4) with a liquid that will absorb hydrogen fluoride, said liquid chosen from among water, and mixtures comprising hydrogen fluoride with a preponderance of water;
6. recovering a vent gas substantially free of ethyl fluoride and hydrogen fluoride.

3,979,476
HYDROCARBON CONVERSION CATALYST AND PROCESS

Jacob D. Kemp, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 324,924, Jan. 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 268,296, July 3, 1972, abandoned. This application Nov. 25, 1974, Ser. No. 526,668

The portion of the term of this patent subsequent to Dec. 3, 1991, has been disclaimed.

Int. Cl.[2] C07C *3/54*

U.S. Cl. 260—683.47 3 Claims

1. A process for alkylating an isoparaffinic hydrocarbon with an olefinic hydrocarbon which comprises contacting a mixture of said isoparaffinic hydrocarbon and said olefinic hydrocarbon, at alkylation conditions including a temperature of about −80°F to 150°F, with a catalytic composition comprising hydrogen fluoride-antimony pentafluoride on a fluorided alumina support, said support having a fluorine content of at least about 60 weight percent and a pore volume of about 0.05 cc to about 0.7 cc per gram.

3,979,477
COMPOSITION OF EPOXIDE RESINS, POLYCARBOXYLIC ACID ANHYDRIDES AND POLYESTER-DICARBOXYLIC ACIDS

Rolf Schmid, Gelterkinden; Friedrich Lohse, Oberwil; Willy Fatzer, Bottmingen, and Hans Batzer, Ariesheim, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 6, 1974, Ser. No. 530,330

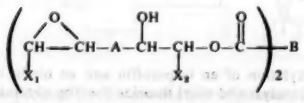
Claims priority, application Switzerland, Dec. 19, 1973, 17809/73

Int. Cl.[2] C08L *63/00*

U.S. Cl. 260—835 14 Claims

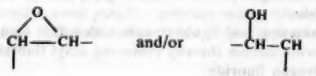
1. A curable epoxide resin composition of epoxide resin, polycaboxylic acid anhydride and polyester-dicarboxylic acid, characterised in that it comprises

a. at least 60 per cent by weight, based on the total amount of epoxide resin, of adducts, containing epoxide groups, of the formula I



(I)

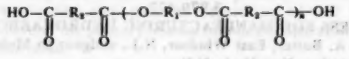
wherein X_1 and X_2 each denote hydrogen or methyl and A denotes the radical, obtained by removal of the 1,2-epoxyethyl groups, of a diglycidyl compound, or wherein A together with X_1 and/or X_2 and with inclusion of the grouping



denotes the cycloaliphatic ring or the cycloaliphataic ring system of a partially reacted cycloaliphatic or cycloaliphatic-aliphatic diepoxide compound, B denotes a long-chain polyester radical consisting essentially of unsubstituted or substituted alkylene and/or alkenylene chains alternating with carboxylic acid ester groups, and the quotient Z/Q, wherein Z is the number of carbon atoms present in the recurring structural element of the radical B and Q is the number of oxygen bridges present in the recurring structural element of the radical B, has to be at least 4 and furthermore the total number of carbon atoms present in the radical B is at least 50,

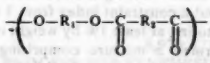
b. polycarboxylic acid anhydrides in an amount of 0.2–0.8 mol per 1 equivalent of epoxide group, and

c. polyester-dicarboxylic acids of the formula II



(II)

wherein R_1 and R_2 denote divalent aliphatic, araliphatic, cycloaliphatic, cycloaliphatic-aliphatic, aromatic or heterocyclic-aliphatic radicals, wherein at least one of the two radicals R_1 or R_2 must contain a carbocyclic or heterocyclic ring or a carbocyclic or heterocyclic ring system and not more than 4 methylene groups are present per ring in the structural element of the formula



and *n* denotes a number from 1 to 30 in an amount of 0.8–0.2 equivalent of carboxyl groups per 1 equivalent of epoxide group.

3,979,478
CATALYSIS OF AMINO RESIN CROSS-LINKING REACTIONS WITH HIGH MOLECULAR WEIGHT SULFONIC ACIDS

Lawrence V. Gallacher, East Norwalk, Conn., assignor to King Industries, Inc., Norwalk, Conn.

Filed May 1, 1974, Ser. No. 466,079

Int. Cl.[2] C08G *12/12*, *12/32*; C08L *61/32*

U.S. Cl. 260—850 23 Claims

1. A composition comprising a convertible amino resin, a catalytically effective amount of a polyalkylaromatic polysulfonic acid having a molecular weight of at least about 500 and a polyfunctional co-reactant capable of combining with said amino resin during conversion to its cured state.

3,979,479
BLOCK COPOLYMERS

Pierino Radici, Turate (Como); Gaudenzio Bianchi, Fagnano Olona (Varese); Daniele Colombo, Castellanza (Varese), and Paolo Colombo, Saronno (Varese), all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Dec. 16, 1974, Ser. No. 533,267

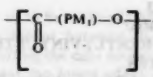
Claims priority, application Italy, Dec. 28, 1973, 32344/73

Int. Cl.[2] C08L *77/02*

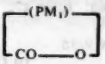
U.S. Cl. 260—857 F 14 Claims

1. A block copolymer of the structure HO—D—A—B—D—H wherein:

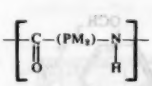
A is a polylactonic block consisting of recurring units:



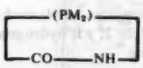
obtainable from at least one monomeric lactone of the formula:



B is a polylactamic block consisting of recurring units:



obtainable from at least one monomeric lactam of the formula:



D is a polyoxymethylene block consisting of recurring units

wherein PM_1 and PM_2 are linear polymethylene chains having from 2 to 13 and 3 to 13 carbon atoms, respectively, nonsubstituted or having at least one hydrogen atom replaced by a radical selected from the group consisting of alkyl, alkylaryl, aryl and cycloalkyl radicals; the said blocks D being present in a proportion of from 5 to 99.9% by weight in the said block copolymer, the group —A—B— having a molecular weight of from 1,000 to 50,000, and the block A being present in said group —A—B— in a proportion of from 1 to 89 percent by weight, said block copolymer HO—D—A—B'D—H being formed by reacting a block copolymer A—B, wherein A and B are as defined above, with anhydrous monomeric formaldehyde, the copolymer A—B being from 1.9 to 89 percent by weight of the total weight of copolymer A—B and said formaldehyde.

3,979,480

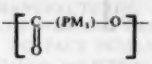
PROCESS FOR THE POLYMERIZATION OF FORMALDEHYDE

Pierino Radici, Turate (Como); Daniele Colombo, Castellanza (Varese), and Paolo Colombo, Saronno (Varese), all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

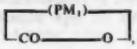
Filed Dec. 16, 1974, Ser. No. 533,268
Claims priority, application Italy, Dec. 28, 1973, 32347/73
Int. Cl.² C08L 77/02
U.S. Cl. 260—857 F **11 Claims**

1. A method for preparing a polyoxymethylene, comprising the step of supplying anhydrous monomeric formaldehyde to a reaction medium comprising an organic diluent which is a liquid and non-solvent for the polyoxymethylene under the reaction conditions and inert towards the other constituents of the reaction medium, and comprising from 0.001 to 0.5 percent by weight of a catalyst based upon the polyoxymethylene, dispersed in said medium, said catalyst having a molecular weight of from 1,000 to 50,000, containing block A in a proportion of from 1 to 89 weight percent, and consisting of a block copolymer carrying ionic couples on its macromolecular chain, said block copolymer being defined by the general structure A-B in which:

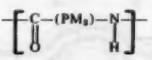
A is a polylactonic block consisting of recurring units:



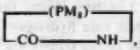
obtainable from at least one monomeric lactone of the general formula:



B is a polylactam block consisting of recurring units:



obtainable from at least one monomeric lactam of the general formula:



wherein PM_1 and PM_2 are polymethylene chains having from 2 to 13 and 3 to 13 carbon atoms, respctively, non-substituted or having at least one hydrogen atom replaced by a radical selected from the group consisting of alkyl, aryl, alkylaryl and cycloalkyl radicals.

3,979,481

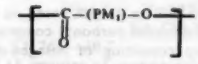
STABILIZATION OF ACETAL POLYMERS

Pierino Radici, Turate (Como); Gaudenzio Bianchi, Fagnano Olona (Varese), and Paolo Colombo, Saronno (Varese), all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

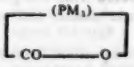
Filed Dec. 16, 1974, Ser. No. 533,269
Claims priority, application Italy, Dec. 28, 1973, 32345/73
Int. Cl.² C08L 77/02
U.S. Cl. 260—857 F **7 Claims**

1. A stabilized composition comprising an acetal polymer having terminal ester, ether or urethane groups and from 0.02 to 12 parts by weight to 100 parts by weight of an acetal polymer of a block copolymer having a molecular weight of from 1,000 to 50,000 and having the general structure R—D—A—B—D—R, wherein

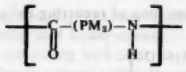
A is a polylactonic block consisting of recurring units



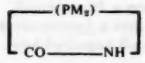
obtainable from at least one monomeric lactone of the formula:



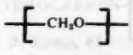
B is a polylactamic block consisting of recurring units



obtainable from at least one monomeric lactam of the formula:



D is a polyoxymethylene block consisting of recurring units



R is a terminal group selected from the class consisting of ester, ether and urethane groups,

wherein PM_1 and PM_2 are linear polymethylene chains having from 2 to 13 and 3 to 13 carbon atoms, respectively, non-substituted or having at least one hydrogen atom replaced by a radical selected from the group consisting of alkyl, aryl, cycloalkyl and aryl alkyl radicals, the blocks D being present in the said copolymer in a proportion of from 5 to 90 percent by weight and the weight ratio of the blocks B to A ranging from 1:1 to 99:1.

3,979,482

PROCESS FOR THE DEGRADATION OF HIGH POLYMER SUBSTANCES

Tsutomu Kagiya, Kyoto; Kunihiko Miyoshi, Takatsuki, and Katsuo Takemoto, Kyoto, all of Japan, assignors to Tsutomu Kagiya, Kyoto; Shinetsu Chemical Company and Tekkosha Co., Ltd., both of Tokyo, all of, Japan

Division of Ser. No. 361,792, March 18, 1973, abandoned. This application Nov. 29, 1974, Ser. No. 528,081

Int. Cl.² C08J 3/20

U.S. Cl. 260—897 C 36 Claims

1. A process for degrading a polymer composition, consisting essentially of the steps of:

1. impregnating a polymer composition consisting essentially of a blend of

A. polyethylene, and

B. from about 5 to about 50 parts by weight, per 100 parts by weight of (A), of chlorinated polyethylene, said chlorinated polyethylene containing from about 10% to about 50% of chlorine atoms, based on the sum of the hydrogen and chlorine atoms thereof,

with

C. from about 0.1 to about 10% by weight, based on the weight of (A), of a halogenated carbonyl compound selected from the group consisting of halogen-substituted ketones, halogen-substituted aldehydes, halogen-containing polyketone copolymers and halogen-containing polymers of an unsaturated ketone obtained by bond opening of the unsaturated bonds of the ketone, wherein said halogen is selected from the group consisting of chlorine, bromine and iodine, and mixtures thereof, and

2. exposing the impregnated polymer composition from step (1) to ultraviolet irradiation or sunlight, in the presence of oxygen or a gas containing oxygen.

3,979,483

ASYMMETRIC OS-DIALKYL-O-[(METHOXYPHENYL)-VINYL]-THIOPHOSPHATES

Alexis A. Oswald, Mountainside, and Paul L. Valint, Woodbridge, both of N.J., assignors to Ciba-Geigy AG, Basel, Switzerland

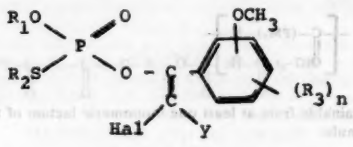
Division of Ser. No. 373,723, June 26, 1973, Pat. No. 3,878,268. This application Feb. 26, 1975, Ser. No. 553,335

Claims priority, application Switzerland, June 27, 1972, 9609/72

Int. Cl.² C07F 9/165; A01N 9/36

U.S. Cl. 260—951 10 Claims

1. A compound of the formula



wherein R_1 is methyl or ethyl; R_2 is propyl or butyl; each R_3 is hydrogen, chlorine or bromine; n is 1 or 2; y is hydrogen or chlorine; and Hal is chlorine or bromine.

3,979,484

O,S-DIALKYL-O-(1-METHOXYPHENYL-2-HALOVINYL)-DITHIOPHOSPHATES

Ernst Beriger, and Jozef Drabek, both of Allschwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

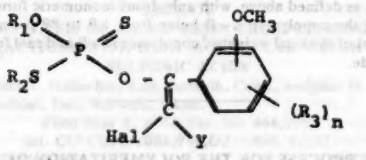
Division of Ser. No. 373,825, June 26, 1973, Pat. No. 3,879,499. This application Feb. 26, 1975, Ser. No. 553,336

Claims priority, application Switzerland, June 27, 1972, 9609/72; May 16, 1973, 7060/73

Int. Cl.² C07F 9/165; A01N 9/36

U.S. Cl. 260—951 10 Claims

1. A compound of the formula



wherein R_1 is methyl or ethyl; R_2 is n-propyl, n-butyl, isobutyl or sec.butyl; each R_3 is hydrogen, chlorine or bromine; n is 1 or 2; y is hydrogen or chlorine; and Hal is chlorine or bromine.

3,979,485

PORTABLE HUMIDIFIER

Kip J. Hoag, Concord, Mich., assignor to McGraw-Edison Company, Elgin, Ill.

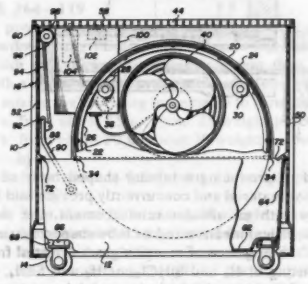
Continuation of Ser. No. 412,710, Nov. 5, 1973, abandoned. This application Feb. 21, 1975, Ser. No. 579,383

Int. Cl.² B01F 3/04

U.S. Cl. 261—30 4 Claims

1. A portable humidifier, in combination comprising a water container, case, and humidifying mechanism; said container being watertight and having a bottom wall and upstanding side walls and having means on the bottom wall adapted to rest on a supporting surface; said case having downwardly extended side walls defining an open bottom interior larger than the container and thereby being adapted to be vertically lowered to telescoping relation with the container for virtually hiding

same or to be vertically lifted from the container, cooperating ledge means between the container and case operable for supporting the case on the container in the telescoped relation whereat the lower edges of the case side walls are disposed closely adjacent but spaced above the supporting surface, said ledge means including inwardly formed projections from the case side walls at intermediate locations spaced from the lower edges thereof which projections are adapted to overlie and butt against the top edge of the container side walls, said case further having spaced apart inlet and outlet openings



communicating with the interior; and the humidifying mechanism being supported by the case and having fan means for moving air successively through the inlet and outlet openings and further having means exposed to the moving air between the inlet and outlet openings and having means extending into the water in the container wetting the air exposed means, and whereby said case is supported on the container and said humidifying mechanism is supported by the case and further whereby the case and the humidifying mechanism supported thereon can be readily separated from the container merely by lifting said case vertically from the container.

3,979,486

PROCESS FOR CONTROLLING THE BALLISTIC CHARACTERISTICS OF DOUBLE-BASE PROPELLANTS

Michel A. Herchin, Saint Medard En Jalles, and Jacques H. Blandin, Pontaillier Sur Saone, both of France, assignors to Societe Nationale des Poudres et Explosifs, France

Filed July 27, 1973, Ser. No. 383,394

Int. Cl.² C06B *21/00*

U.S. Cl. 264—3 B **6 Claims**

1. The process of preparing a double-base propellant composition in which the position of the plateau is shifted towards lower speeds and pressures, which consists of manufacturing granules of a base powder, the essential component of which is nitrocellulose, a portion of said nitrocellulose having a nitrogen content higher than 12.6%, and a second portion having a nitrogen content at most equal to 12.6%, in a proportion at the most 60% of the nitrocellulose of higher nitrogen content, the average nitrogen content of the granules being greater than 12.6%, the two samples of nitrocellulose differing only in the nitrogen content, and gelatinizing said granules with an explosive oil.

3,979,487

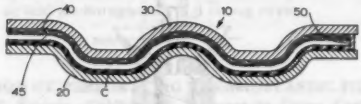
PROCESS FOR MANUFACTURING A FOAMED RESIN ARTICLE HAVING A FLOCKED THREE DIMENSIONAL SURFACE DESIGN

William H. Squier, Taylors, and William E. Poteat, Greer, both of S.C., assignors to M. Lowenstein & Sons, Inc., New York, N.Y.

Division of Ser. No. 294,353, Oct. 2, 1972, Pat. No. 3,852,146, which is a continuation-in-part of Ser. No. 272,340, July 17, 1972. This application Apr. 19, 1974, Ser. No. 462,438

Int. Cl.² B29C *27/14*; B29D *27/04*

U.S. Cl. 264—24 **17 Claims**



1. A process for producing a shaped foamed resin article having a three dimensional surface design along at least a portion of the surface of same comprising the steps of:

a. providing a master mold, said mold having a plurality of matched sections, said sections having cavities therein that cooperate to define the contour of said shaped article;

b. producing an exact reverse replica of the surface of an item whose three dimensional surface characteristics are to be imparted to at least a portion of the surface of said shaped article, said surface replica being produced by casting a room temperature vulcanizable polymer over the surface of a model of said item, permitting the polymer to vulcanize and removing the model;

c. securing the reverse surface replica within and along the contour of such of said cavities as are desired to impart the three dimensional surface characteristics of said item to the predetermined surface of said article;

d. casting a foam resin producing reaction mixture into certain of said mold sections;

e. bringing all of said mold sections into registry;

f. permitting said mixture to react and form said foam resin in conformity with said cavities and said reverse replica to produce a unitary foam resin article;

g. removing said shaped, unitary foam resin article from said mold;

h. applying adhesive over said replica surface of said produced foam resin article; and

i. applying flock fibers over said surface where said adhesive has been applied to bond said fibers to said article and simulate surface characteristics of said item from which the reverse replica was made.

3,979,488

PROCESS OF CONTINUOUSLY BLENDING, MOLDING AND CURING HEAT CURABLE POLYMERIC COMPOUNDS

Milton Sharples Greenhalgh, Bridgeport, and Ray Clarence Lever, Fairfield, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Dec. 20, 1973, Ser. No. 426,964

Int. Cl.² B29F *1/08*

U.S. Cl. 264—40.7 **14 Claims**

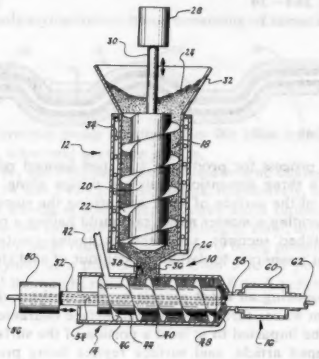
1. A process of continuously molding to shape and curing an ethylene-containing polymer and a heat-activated organic peroxide curing agent to a thermoset condition, comprising the steps of:

a. continuously advancing a mass of an ethylene-containing polymer and a heat-activated organic peroxide curing agent through a preceding extruder comprising a barrel containing a rotatable screw and therein progressively mixing and fluxing said continuously advancing mass of ethylene-containing polymer and curing agent by mechanically working with the extruder screw rotating at

about 20 to about 40 revolutions per minute, and heating said mass to a temperature of not higher than about 250°F;

b. continuously advancing the mass of ethylene-containing polymer and curing agent progressively from said preceding extruder to a subsequent extruder comprising a barrel and rotatable screw;

c. continuously advancing the mass of ethylene-containing polymer and curing agent through the subsequent extruder and therein progressively further mixing and fluxing said continuously advancing mass to a homogeneous melt and heating its mass uniformly therethrough up to at least about 350°F by vigorous mechanical working with the rotatable screw rotating at about 300 to about 400 revolutions per minute; and,

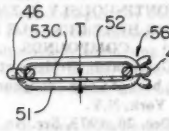


d. continuously and directly advancing said homogeneous molten mass of ethylene-containing polymer and curing agent heated to at least about 350°F, progressively through a forming die and thereby molding it to shape and completing the cure of the shaped polymeric compound to a thermoset condition.

3,979,489
METHOD OF MAKING CARPET UNDERLAY

George R. Sprague, Dyersburg, Tenn., assignor to Colonial Rubber Works, Inc., Dyersburg, Tenn.

Division of Ser. No. 380,429, July 18, 1973. This application June 26, 1975, Ser. No. 590,663
Int. Cl.² B29D 27/00
U.S. Cl. 264—51 3 Claims

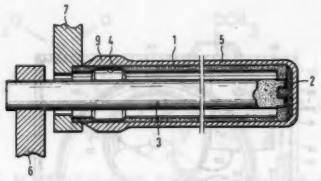


1. A method of making carpet underlay comprising the steps of forming an endless conveyor means of heat resistor wire-like mesh material having openings with heat resistant elongated flat strips inserted therein, forming a sheet of elastomeric material, depositing said sheet on said mesh material, heating said sheet to soften it and to cause it to droop around said mesh material, forming a plurality of U-shaped channels in the upper surface of said sheet as a result of said droop, limiting said droop on the lower surface of said sheet by means of said strips, further utilizing said strips to prevent said sheet from passing completely through said openings in said mesh material and simultaneously expanding and curing said formed sheet.

3,979,490
METHOD FOR THE MANUFACTURE OF TUBULAR BODIES OF SEMICONDUCTOR MATERIAL

Wolfgang Dietze, Munich; Konrad Reuschel, Vaterstetten, and Andreas Kasper, Garching-Hochbruck, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin, Munich, Erlangen, Germany

Continuation of Ser. No. 205,492, Dec. 7, 1971, abandoned. This application Nov. 19, 1973, Ser. No. 417,380
Claims priority, application Germany, Dec. 9, 1970, 2060651
Int. Cl.² B01J 17/30, 17/32
U.S. Cl. 264—81 9 Claims

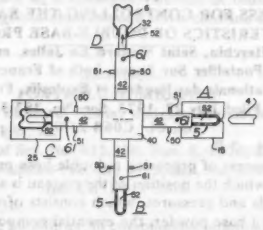


1. Method of producing a tubular shaped body of silicon semiconductor material and concurrently provide said tubular shaped body with an annular reinforcement, the steps of: heating by electrical means a rod or tube-shaped carrier body of carbon in the presence of reaction gases selected from the groups consisting of H_2 and $SiHCl_3$, or H_2 and $SiCl_4$, for the precipitation of said semiconductor material to temperature sufficient to cause precipitation out of said reaction gases of a layer of semiconductor material on the surface of the carrier body; simultaneously therewith, heating by electrical means, a surface of at least one annular zone, disposed about the periphery of the carrier body to a temperature different to that of the remainder of the carrier body to cause more rapid precipitation out on the surface of said annular zone of the carrier body to form an annular reinforcement of greater wall thickness than the tubular shaped body; and separating the tubular shaped body of semiconductor having an annular reinforcement from the carrier body.

3,979,491
PROCESS FOR THE MANUFACTURE OF AN ORIENTED CONTAINER

Fred J. Zavasnik, Bolingbrook, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Nov. 24, 1971, Ser. No. 201,823
Int. Cl.² B29C 17/07
U.S. Cl. 264—97 2 Claims



1. A process for making a hollow article of thermoplastic material which comprises

a. injecting a thermoplastic material having a nitrile monomer content of at least 60% into an injection mold about a core to form a parison;

b. cooling the interior wall of the parison to a temperature just above its glass transition temperature and the exterior

wall to a temperature below the glass transition temperature;

c. permitting the exterior wall to reheat to a temperature above the glass transition temperature by heat transfer from the interior of the parison; and

d. expanding the parison into a hollow article.

3,979,492

PROCESS FOR PRODUCING FIBERBOARD

Richard D. Sundie, Montvale, and Walter L. Pennie, Morristown, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Division of Ser. No. 431,535, Jan. 7, 1974, which is a division of Ser. No. 210,160, Dec. 20, 1971, Pat. No. 3,891,590. This application Dec. 6, 1974, Ser. No. 530,313

Int. Cl.² B29J *5/04*

U.S. Cl. 264—119 **8 Claims**

1. A process for producing fiberboard comprising:

A. impregnating fibrous material in which the fibers have width and thickness shorter in extent than their length with a curable amino resin, said resin being prepared by:

1. mixing the following ingredients to form component I:

a. from about 15 to about 25 weight percent urea;

b. from about 30 to about 70 weight percent formaldehyde;

c. from about 4.5 to about 10 weight percent melamine;

d. from about 10 to about 30 weight percent water;

e. from about 0.05 to about 4.0 weight percent stabilizer, said stabilizer comprising a buffering agent which maintains the pH of the composition within the range from about 4.0 to about 7.5;

2. mixing the following ingredients to form component II:

a. from about 35 to about 50 weight percent urea;

b. from about 45 to about 65 weight percent water; and

c. from about 0.5 to about 3.0 weight percent catalyst which promotes the reaction of urea, melamine and formaldehyde; and

3. mixing together from about 40 to about 60 parts of component I with correspondingly from about 60 to about 40 parts of component II to form the curable amino resin;

B. forming the impregnated fibrous material into a mat; and

C. compressing the mat to a desired thickness between pressing platens maintained at a temperature above 280°F. and at a pressure above 500 psi, until the resin becomes intimately bonded to the fibrous material thereby forming the fiberboard.

3,979,493

METHOD FOR PRODUCING GLASS FIBER REINFORCING MEMBERS

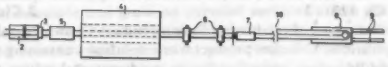
Neil McIver Cameron, Southport; Kenneth Cyril Thatcher, Billinge, and Frederick Paul Mallinder, Southport, all of England, assignors to Fibreglass Limited, St. Helens, England

Filed Aug. 15, 1974, Ser. No. 497,756

Claims priority, application United Kingdom, Jan. 7, 1974, 649/74

Int. Cl.² B29G *7/00*

U.S. Cl. 264—145 **6 Claims**



1. In a method for producing glass fiber reinforcing straps with an anchorage point at least at one end comprising continuously passing resin-impregnated glass fiber rovings through a die to shape the rovings into a ribbon, and subsequent curing of the resin on passage of the shaped ribbon through a curing oven, the improvement comprising surrounding the ribbon prior to curing at selected discrete locations along its length by casings which travel with the ribbon through the curing oven, the casings serving to prevent or inhibit curing in said discrete locations so that the ribbon emerges from the oven with cured lengths of ribbon separated from one another by uncured portions, the casings being positioned so as to produce desired lengths of cured ribbon separated by desired lengths of uncured ribbon, cutting the ribbon after it leaves the curing oven to form individual straps having uncured portions between their ends so that a double strap can be formed by bending the strap back on itself at the uncured portion, thus forming an anchorage area for each strap at the uncured portion and then curing the uncured portions while formed as said anchorage area in a curing oven.

3,979,494

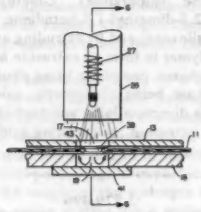
METHOD OF PERFORATING THERMOPLASTIC FILM

Alvin E. Ericson, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 446,060, Feb. 26, 1974. This application July 3, 1975, Ser. No. 593,130

Int. Cl.² B29F *5/00;* **B29D** *7/20*

U.S. Cl. 264—154 **2 Claims**



1. A method of making an apexed hole having a varying thickness hole edge perimeter of melted and rehardened plastic in a thermoplastic film sheet material comprising the steps of;

masking the thermoplastic film sheet material with a heat resistant masking template having an opening therein of a size and apexed shape substantially congruent with a preselected size and apexed shape of the hole being formed;

disposing the thermoplastic film sheet material and the masking template on a backing template having an opening therein of a size and shape substantially similar to the size and shape of the opening in the masking template, the opening in the masking template and the opening in the backing template being juxtaposed in substantially concentric alignment;

directing a stream of gas heated to a temperature sufficient to effect rapid melting of the thermoplastic film material into impingement on the masking template and the thermoplastic film sheet material between the openings in the masking template and the backing template for a time sufficient to melt through the thermoplastic film sheet material between said openings, the concentric centerline of said stream being offset epicentrically from the concentric centerline of the juxtaposed openings in the masking and backing templates towards the apex of the hole being formed;

removing the stream of gas from impingement on the masking template; and

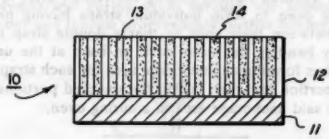
removing the thermoplastic film sheet material from the templates after the melted thermoplastic film material has at least partially rehardened.

3,979,495

METHOD OF MAKING A PHOTORECEPTOR

Peter F. Erhardt, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 27, 1974, Ser. No. 527,664
Int. Cl.² B29D 7/18
U.S. Cl. 264—158 2 Claims



1. The method of making a photoconductive layer for use in a xerographic process, said layer having plural photoconductive paths oriented substantially perpendicular to a surface of said layer, said method consisting essentially of:

a. preparing a photoconductive block copolymer by anionic copolymerization of a polynuclear condensed aromatic vinyl compound selected from the group consisting of 3-vinylpyrene, 2-vinylanthracene, 2-propenyl-2-anthracene and 2-vinyl-N-alkyl carbazoles with a monomer selected from the group consisting of 1,3-butadiene, 1,3-pentadiene (piperyline), 2-methyl-1,3-butadiene (isoprene), 2,3-dimethyl-1,3-butadiene and cyclic octamethyl tetrasiloxane; and b) extruding and cooling a melt of said copolymer to form an extrusion having lamellae of at least two phases, one phase being photoconductive and the other phase being elastomeric, said lamellae being disposed in a direction lying substantially parallel to the direction of extrusion, and cutting said extrusion transversely to form said layer.

3,979,496

METHOD OF IMPARTING LATENT CRIMP IN POLYOLEFIN SYNTHETIC FIBERS

Eckhard C. A. Schwarz, 115 N. Park Ave., Neenah, Wis. 54956

Continuation-in-part of Ser. No. 434,314, Jan. 17, 1974, Pat. No. 3,949,041. This application Jan. 9, 1976, Ser. No. 647,829
Int. Cl.² D01D 5/22
U.S. Cl. 264—168 11 Claims

1. A method of forming latent crimp in synthetic thermoplastic addition polymers such as polyethylene and polypropylene, comprising the steps of:

A. Heating discrete spaced zones on one side of molecularly orientable filaments, to a temperature from about 100°C to about 280°C for a time in seconds which is equal to X times denier per filament, where X is a value which falls within the range of 0.001 to 0.00001 and wherein the centers of said zones are spaced from 2 to 50 times the filament thickness, said heating of said zones being effected by guiding the filaments about a rotating heated grooved roll having circumferentially spaced lands generally parallel to the roll axis with the lands spaced 2 to 50 times the thickness of the filament;

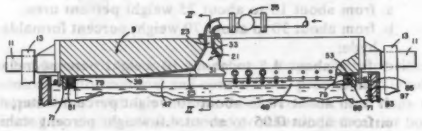
B. Subsequently subjecting said filaments to molecular orientation by stretching them to a percent stretch which is at least (0.006/birefringence) − 0.5, by guiding the filaments at a first velocity rate over the grooved roll and drawing the filaments away from the grooved roll at a faster second rate.

3,979,497

FILM EXTRUSION METHOD

Daniel J. Ryan, Chester, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Filed Jan. 14, 1974, Ser. No. 433,424
Int. Cl.² D01F 2/00
U.S. Cl. 264—187 8 Claims



1. A method for making a film in which beam formation along opposite longitudinal edges thereof is at least minimized including the steps of extruding a generally flat stream of coagulable solution through an elongated orifice and into a setting bath within which bath the extruded stream is coagulated into a film, imparting a concave contour along each of the opposite longitudinal edges of the stream of coagulable solution immediately prior to and during its passage through the elongated orifice, during the coagulation thereof advancing the extruded stream through the setting bath at a speed which is greater than the velocity at which the coagulable solution is extruded through the elongated orifice, and allowing the contoured edges of the extruded stream to freely reshape themselves into a generally rounded contour under the influence of interfacial surface tension forces acting upon such stream coagulable solution as it enters into and passes through the setting bath.

3,979,498

RECOVERY OF CESIUM AND PALLADIUM FROM NUCLEAR REACTOR FUEL PROCESSING WASTE

David O. Campbell, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Aug. 6, 1975, Ser. No. 602,503
Int. Cl.² C01B 9/02; C01D 17/00; C01G 55/00
U.S. Cl. 423—2 3 Claims

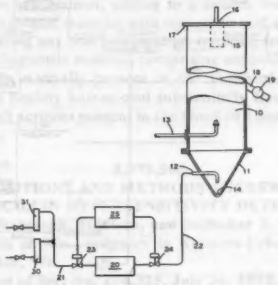
1. A method of recovering fission product Cs and Pd values from nitric acid fission product waste solution containing said Cs and Pd values and other fission product metal values, said solution resulting from reprocessing irradiated nuclear fuel, said method comprising oxidizing Pd ions present in said solution to Pd^{+4}, contacting said solution with a source of chloride ions capable of causing the precipitation of said Cs and Pd values as Cs_2PdCl_6, and recovering the resulting precipitate.

3,979,499

METHOD FOR REDUCING URANIUM TETRAFLUORIDE

Henry M. Heidt, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Continuation of Ser. No. 17,682, March 9, 1970, abandoned.
This application Feb. 22, 1974, Ser. No. 444,624
Int. Cl.[2] C01G *43/00*
U.S. Cl. 423—253 3 Claims



1. A process for the treatment of uranium hexafluoride which comprises the steps of passing of a flow of gaseous uranium hexafluoride to a reaction zone, passing a pulsed flow of a gaseous reactant medium comprising nitrogen and steam into the reaction zone to maintain a zone temperature of 450° to 600°F and a pressure slightly above atmospheric to enable the uranium hexafluoride to initially form only from said gases fine solid particles containing substantially only UO_2F_2, continuing the treatment of the uranium hexafluoride within said reaction zone to increase the size of the formed fine particles and to accumulate further fine particles in the reaction zone, and adjusting the rate of pulsed flow of reactant medium to the reaction zone by increasing the pressure of the reactant medium to a maximum pressure about twice atmospheric while simultaneously reducing the frequency of the pulsed flow in accordance with the amount of solid particles therein.

3,979,500

PREPARATION OF FINELY-DIVIDED REFRACTORY POWDERS OF GROUPS III-V METAL BORIDES, CARBIDES, NITRIDES, SILICIDES AND SULFIDES

Robert S. Sheppard, Doylestown, and Franklin E. Groening, Akron, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 356,544, May 2, 1973, abandoned.
This application May 12, 1975, Ser. No. 576,835
Int. Cl.[2] C01B *35/04*, *21/06*, *31/30*, *33/06*
U.S. Cl. 423—289 16 Claims

1. In the process of producing finely-divided refractory powder selected from the group consisting of borides, carbides, silicides, nitrides and sulfides of a metal selected from groups III-V of the Periodic Chart of the Elements by vapor phase reaction in a reactor of a halide of the selected metal and a source of boron, carbon, silicon, nitrogen or sulfur respectively as reactants, wherein the reactants are introduced into a principal reactant mixing zone of the reactor through reactant inlet assembly means and reacted to produce a finely-divided powdery product and wherein powdery product tends to accumulate and grow on exposed surfaces of the reactant inlet assembly means that are exposed to said reactants, the improvement which comprises projecting a stream of hydrogen gas into the principal reactant mixing zone, introducing said reactants and substantially anhydrous hydrogen halide into the principal reactant mixing zone, said hydrogen halide being introduced in amounts sufficient to retard growth of powdery product on said exposed surfaces, the halide portion of said hydrogen halide corresponding to the halide of the selected metal, reacting said reactants out of contact with exposed surfaces of the reactor, and removing the powdery product from the reactor.

3,979,501

METHOD AND APPARATUS FOR CONVERTING NITROGEN DIOXIDE TO NITRIC OXIDE

Quade R. Stahl, Springfield, Va., assignor to Meloy Laboratories, Inc., Springfield, Va.

Filed Mar. 28, 1975, Ser. No. 562,819
Int. Cl.[2] C01B *21/24*
U.S. Cl. 423—405 3 Claims

1. A method of converting nitrogen dioxide or the like in a gas to nitric oxide without significant conversion of ammonia, which comprises passing said gas over a copper-containing catalyst maintained at a temperature within the range of about 220°C to about 240°C.

3,979,502

METHOD OF ELIMINATING CHLOROACETYLENES PRESENT IN HYDROGEN CHLORIDE GAS

Yves Correia, and Francois Muller, both of Saint-Auban, France, assignors to Rhone-Progil, Courbevoie, France

Filed Nov. 25, 1974, Ser. No. 526,748
Claims priority, application France, Nov. 27, 1973, 73.42140
Int. Cl.[2] C01B *7/08*
U.S. Cl. 423—488 5 Claims

1. A method of eliminating monochloroacetylene and dichloroacetylene in an impure hydrogen chloride gas containing same and other gaseous contaminants essentially comprising the steps of:

a. subjecting the chloroacetylenes to a hydrochlorination reaction by passing the impure hydrogen chloride gas through a bed of active carbon at a temperature from 50° – 250°C, and wherein the quantities of chloroacetylenes is not more than 2% by weight of the hydrogen chloride gas and the total percentage of impurities by weight is less than 5% of the weight of the hydrogen chloride gas, and in which the active carbon has a surface over of 700 – 1600 m^2, and for a sufficient period of time until the hydrogen chloride gas leaving the reactor is essentially complete free of the said chloroacetylenes;

b. recovering the purified hydrogen chloride gas.

3,979,503

METHOD AND APPARATUS FOR PROCESSING FLUID MATERIALS PARTICULARLY IN THE PREPARATION OF SAMPLES FOR RADIOACTIVE ISOTOPE TRACER STUDIES

Niilo H. Kaartinen, Turku, Finland, assignor to Packard Instrument Company, Inc., Downers Grove, Ill.

Continuation of Ser. No. 728,939, May 14, 1968, abandoned.
This application Aug. 2, 1972, Ser. No. 277,261
The portion of the term of this patent subsequent to Dec. 23, 1986, has been disclaimed.
Int. Cl.[2] C01B *5/02*, *31/20*; C09K *11/04*
U.S. Cl. 423—580 17 Claims

1. A method of preparing isotope-containing samples for use in studies utilizing radioactive isotopes, said method comprising the steps of

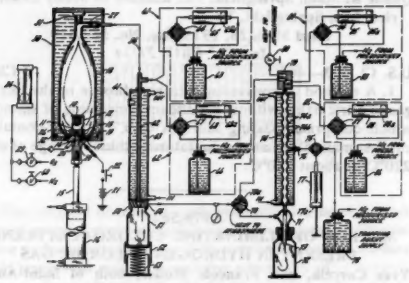
a. combusting a sample of material containing the isotope tritium in a combustion chamber to produce combustion products containing tritiated water vapor,

b. continuously exhausting the tritiated water vapor from said combustion chamber during the combustion of said material,

c. continuously cooling the exhausted combustion products in a heat exchanger to convert the tritiated water vapor to a liquid during the combustion of said material,

d. continuously removing said isotope-containing liquid from said heat exchanger during the combustion of said material and transferring said liquid to a sample collec-

tion vessel to provide a liquid sample containing the recovered isotope for use in studies utilizing radioactive isotopes,



e. and purging said combustion chamber and heat exchanger between the combustion of successive isotope-containing samples.

3,979,504

CALCINING METHOD FOR ALUMINA

William C. Ziegenhain; David V. Porchey, both of Ponca City, and Ralph T. Ferrell, Norman, all of Okla., assignors to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 355,627, April 30, 1973, which is a continuation-in-part of Ser. No. 261,477, June 9, 1972, abandoned. This application Jan. 6, 1975, Ser. No. 538,991

Int. Cl.² C01F 7/00

U.S. Cl. 423—628 **5 Claims**

1. In a process for producing a low-density, high-porosity, high-surface area product alumina from an aqueous alumina slurry containing up to about 32 weight percent Al_2O_3 and produced by:

a. hydrolyzing aluminum alkoxides with an effective amount of water to form an organic reaction product and an aqueous alumina slurry; and,

b. thereafter separating the aqueous alumina slurry from the organic reaction product in the absence of steam stripping,

wherein said aqueous alumina slurry is contacted with an organic solvent selected for the group consisting of ethanol, propanol, isopropanol, butanol, isobutanol and tertiary butanol in an amount sufficient to produce a product alumina having a loose bulk density from about 7.5 to about 25 lb/ft³, a surface area from about 275 to about 400 m²/g and a pore volume from about 1 to about 2.75 cc/g, to form a solvent-aqueous alumina mixture; said mixture is dried and said dried alumina is calcined and said product alumina is recovered, the improvement comprising

a. calcining said dried alumina at a temperature in excess of at least 500°F in an inert atmosphere selected from the group consisting of nitrogen, argon, helium, hydrogen, carbon monoxide, and mixtures thereof;

b. cooling the calcined alumina to a temperature below about 300°F in the presence of said inert atmosphere; and,

recovering said product alumina, said product alumina being substantially white and extrudable.

3,979,505

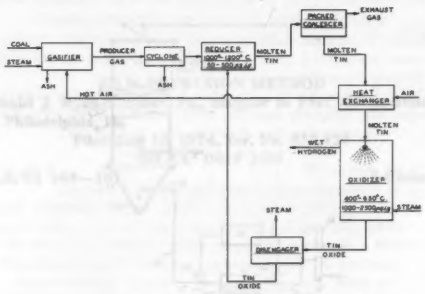
METHOD FOR MAKING HYDROGEN

Walter H. Seitzer, West Chester, Pa., assignor to Sun Ventures, Inc., St. Davids, Pa.

Filed Sept. 3, 1974, Ser. No. 502,476

Int. Cl.² C01B 1/02, 1/08

U.S. Cl. 423—657 **5 Claims**



1. A process for manufacturing hydrogen which comprises reducing SnO_2 in a reducing zone at about 1000° to about 1200°C. with a reducing gas to form molten tin, feeding the molten tin as a spray into an oxidizer zone containing steam maintained at about 400° to about 650°C. and at a about 1000 to about 2500 psig, whereby the reaction of the tin with the steam forms hydrogen and tin oxide, separating hydrogen product under pressure and recycling the tin oxide to the reducing zone.

3,979,506

RADIOACTIVE COMPOUNDS FOR LABELING PROTEINS

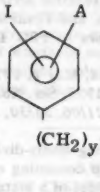
Paul K. Smith, Rockford, Ill., assignor to Pierce Chemical Company, Rockford, Ill.

Filed Oct. 11, 1974, Ser. No. 514,139

Int. Cl.² A61K 43/00; C07C 119/00, 122/00

U.S. Cl. 424—1 **11 Claims**

1. A compound having the structural formula



$$(CH_2)_y-C(=NH_2^+X^-)-O-R$$

wherein I is a radioactive isotope; A is hydroxy or an alkoxy group; y is an integer; R is an alkyl group; and X is a halogen.

5. A compound having the structural formula

$$(CH_2)_yCN$$

wherein I is a radioactive isotope; A is hydroxy or an alkoxy group and y is an integer.

3,979,507

DIAGNOSTIC SYSTEM FOR ORGAN ABNORMALITIES

Albert Leroy Baker, Matteson, Ill., assignor to Wilson Pharmaceutical & Chemical Corporation, Chicago, Ill.

Filed Nov. 23, 1973, Ser. No. 418,618
Int. Cl.[2] A61K *43/00, 39/00;* G01T *1/16*
U.S. Cl. 424—1.5 12 Claims

1. A method of diagnosing a patent for an abnormal condition of a specific organ which comprises taking a sample of blood from said patient, adding to a soluble fraction of said blood a diagnostic material with respect to said specific organ and measuring any reaction product resulting from said addition, said diagnostic material comprising antibodies to at least one antigen normally present in the tissue of said specific organ of a healthy human and substantially free of any antibodies to all antigens present in the blood of a healthy human.

3,979,508

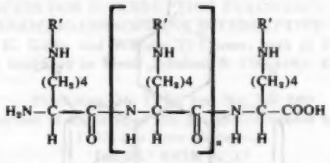
COMPOSITIONS AND METHODS THEREWITH FOR PENICILLIN HYPERSENSITIVITY DETECTION

Mark A. Stahmann, Madison, and Sudhakar S. Wagle, Mequon, both of Wis., assignors to Kremers-Urban Company, Milwaukee, Wis.

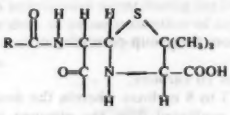
Division of Ser. No. 274,325, July 24, 1972, Pat. No. 3,867,365, which is a continuation-in-part of Ser. No. 61,514, Aug. 5, 1970, abandoned, which is a continuation-in-part of Ser. No. 656,323, July 27, 1967, abandoned. This application Jan. 10, 1975, Ser. No. 539,987
Int. Cl.[2] A61K *29/00, 31/43, 37/02*
U.S. Cl. 424—9 22 Claims

1. A composition useful for eliciting cutaneous responses in persons with penicillin hypersensitivity, comprising at least one

water soluble penicilloyl-polylysine conjugate represented by the formula:



wherein: n is an integer from about 10 to about 100; and R′ is selected from the class consisting of H and the penicilloyl substituents represented by the formula:



wherein R is selected from the group consisting of benzyl, allylthiomethyl, phenoxyethyl, phenoxymethyl, 2,6-dimethoxyphenyl, 5-methyl-3-phenyl-4-isoxazolyl, 2-ethoxy-1-naphtyhyl, and alpha-aminobenzyl, and in which at least 40% of said R′ groups are the penicilloyl substituents;

wherein said conjugate has an optical rotation corrected for the contributions of said polylysine in said conjugate yielding a specific rotation in excess of $[\alpha]_D^{25} + 100°$ for 1×10^{-2} M penicilloyl groups contained in the conjugate;

said conjugate is free from penamaldate and penicillenate groups;

said conjugate is soluble in water without succinylation;

said conjugate, in an effective amount, contained in a suitable pharmaceutical carrier for intra-cutaneous testing.

12. The method of detecting penicillin hypersensitivity which comprises applying to a patient the composition of claim 1 by a scratch test technique or intracutaneous injection.

3,979,509

OPAQUE LAYER METHOD FOR DETECTING BIOLOGICAL PARTICLES

Ivar Giaever, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 3, 1974, Ser. No. 503,030
Int. Cl.[2] G01N *33/16, 21/04*
U.S. Cl. 424—12 29 Claims

1. A diagnostic method for detecting the presence or absence of select biological particles in a liquid sample comprising the steps of

contacting surface area of a substrate with first biological particles, said first biological particles being specific to the select biological particles and being disposed as a first layer coating said surface area,

contacting the coated surface area of said substrate with the liquid sample for a preselected period of time,

depositing a porous, opaque layer of particles over said surface area so processed, said particles being nonreactive with the substrate member, the first biological particles, the sample liquid and the cleaving agent solution to be subsequently employed,

contacting the surface area as modified by the preceding steps with a cleaving agent solution, said said solution being capable of selectively destroying such bonding as may exist between said first biological particles and select biological particles, and

examining said porous, opaque layer to determine whether said porous, opaque layer is intact or has a portion thereof removed, the latter being indicative of the presence of select biological particles in the liquid sample.

3,979,510

ALUMINUM-ZIRCONIUM ANTI-PERSPIRANT SYSTEMS WITH COMPLEX ALUMINUM BUFFERS

Andrew M. Rubino, New Providence, N.J., assignor to Armour Pharmaceutical Company, Phoenix, Ariz.

Continuation-in-part of Ser. Nos. 418,712, Nov. 23, 1973, and Ser. No. 431,639, Jan. 8, 1974, and Ser. No. 433,931, Jan. 16, 1974. This application June 7, 1974, Ser. No. 477,544
Int. Cl.[2] A61K *7/32*
U.S. Cl. 424—47 17 Claims

1. An astringent, water soluble complex formed by reacting the following components (a), (b) and (c) in aqueous medium:

a. a basic aluminum compound selected from the group having the general empirical formula:

$$Al_n(OH)_{6-xz}A_z$$

wherein x may vary from greater than 0 to less than 6, $6-nx$ is greater than or equal to 0, n is the valence of A, and A is selected from the group consisting of halide, nitrate, sulfamate, sulfate and mixture thereof;

b. a zirconium compound selected from trioxodizirconium salts and the group having the general empirical formula:

$$ZrO(OH)_{2-nz}B_z$$

wherein z may vary from 0.9 to 2, n is the valence of B, $2-nz$ is greater than or equal to 0, and B is selected from the group consisting of halide, nitrate, sulfamate, sulfate and mixture thereof; and

c. a complex aluminum buffer compound selected from the group consisting of hydrated magnesium aluminate, hydrated magnesium aluminum sulfate, and the co-dried or co-precipitated reaction product of aluminum hydroxide

with a carbonate selected from the group consisting of magnesium carbonate, calcium carbonate, sodium carbonate and mixtures thereof;

said basic aluminum and zirconium compounds being present in such amounts as to yield an Al/Zr mole ratio of about 10:1 to 1:10, and said buffer compound being present in such an amount that the pH of a 5 to 15 weight percent (based on the oxides of Al and Zr) aqueous solution of the complex is at least about 3.

3,979,511

INHIBITORS OF REVERSE TRANSCRIPTASE ENZYMES

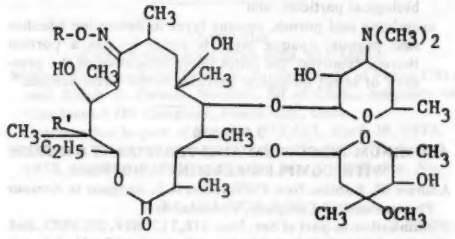
Paul P. Hung; Nathan L. Shipkowitz, both of Waukegan, and Anne Mary Von Esch, North Chicago, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed May 23, 1974, Ser. No. 472,564

Int. Cl.[2] A61K *31/71*

U.S. Cl. 424—181 **6 Claims**

1. A method for inhibiting the activity of reverse transcriptase in Rous sarcoma viruses in an animal which comprises administering to an animal being infected with said virus an effective amount for inhibiting said enzyme of a compound of the formula



wherein R^1 is hydrogen or hydroxyl and R is C_1-C_8 alkyl, cyclohexyl, phenyl, benzyl and 3,4 dichlorobenzyl.

3,979,512

S-(AMIDOCARBONYL)-METHYL-O-ALKYL-MONOTHIOPHOSPHORIC ACID ESTER AMIDES

Claus Stölzer, Wuppertal-Vohwinkel; Ingeborg Hammann, Cologne, and Günter Unterstenhöfer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

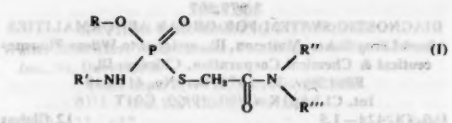
Division of Ser. No. 385,001, Aug. 2, 1973, Pat. No. 3,907,938. This application Mar. 24, 1975, Ser. No. 561,589

Claims priority, application Germany, Aug. 16, 1972, 2240032

Int. Cl.[2] C07D *295/10*

U.S. Cl. 424—200 **7 Claims**

1. An S-(amidocarbonyl)-methylmonothiophosphoric acid ester amide of the formula



(I)

in which

R and R′ each independently is alkyl of 1 to 6 carbon atoms, and

R″ and R‴ conjointly with the nitrogen atom to which they are attached form a piperidino, morpholino, thiazolino or diazolino ring.

5. An insecticidal or acaricidal composition comprising an insecticidally or acaricidally effective amount of a compound according to claim 1 in admixture with a diluent.

3,979,513

1′-SUBSTITUTED-9,10-DIHYDROANTHRACENE-9-SPIRO-4′-PIPERIDINE DERIVATIVES

Ronald Hilson Begg Galt, and Alasdair Thomas Glen, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

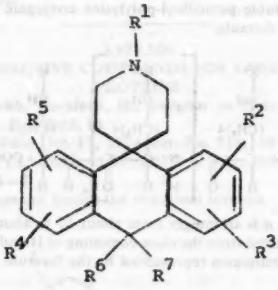
Filed Jan. 16, 1975, Ser. No. 541,693

Claims priority, application United Kingdom, Feb. 4, 1974, 5018/74

Int. Cl.[2] C07D *221/20*

U.S. Cl. 424—267 **10 Claims**

1. A dihydroanthrancene derivative of the formula:-



wherein

R^1 is selected from the group consisting of

1. hydrogen;
2. alkyl of 1 to 10 carbons;
3. alkenyl of 3 to 8 carbons wherein the double bond it contains is separated from the nitrogen atom of the spiropiperidine ring by at least one carbon;
4. cycloalkylalkyl of 4 to 7 carbons, optionally substituted in the cycloalkyl nucleus by an aryl of 6 to 10 carbons or by one or two alkyls of 1 to 3 carbons;
5. arylalkyl of 4 to 10 carbons, optionally substituted in the aryl nucleus by one to three halogens or alkyls of 1 to 3 carbons;
6. hydroxyalkyl of 2 to 5 carbons wherein the oxygen atom it contains is separated from the nitrogen atom of the spiropiperidine ring by at least two carbons; and
7. dialkylaminoalkyl of 4 to 8 carbons wherein the nitrogen atom it contains is separated from the nitrogen atom of the spiropiperidine ring by at least two carbons;

R^2, R^3, R^4 and R^5, which may be the same or different, are selected from the group consisting of

8. hydrogen;
9. halogen;

10. alkyl of 1 to 5 carbons;
11. haloalkyl of 1 to 5 carbons;
12. alkoxy of 1 to 5 carbons;
13. hydroxy;
14. alkanoyloxy of 1 to 5 carbons;
15. aroyloxy of 7 to 10 carbons, optionally substituted in the aryl nucleus by one to three halogens or alkyls of 1 to 3 carbons; and
16. hydroxyalkyl of 1 to 5 carbons;

R^6 is selected from the group consisting of
17. hydrogen;
18. alkyl of 1 to 3 carbons;
19. alkylthio of 1 to 3 carbons;
20. alkanoyloxy of 1 to 3 carbons; and
21. hydroxy;

and R^7 is selected from the group consisting of
22. hydrogen; and
23. alkyl of 1 to 3 carbons;

or R^6 and R^7 together stand for
24. oxygen or
25. methylene;

and the pharmaceutically-acceptable acid-addition salts thereof.

10. A method of relieving or preventing pain in warm-blooded animals including man which comprises administering an analgesically-effective amount of a compound of claim **1.**

3,979,514
PROCESS FOR INTERRUPTING PREGNANCY WITH SULFONAMIDOAMINOPHENE INTERCEPTIVE AGENTS

Duane G. Gallo, and William T. Comer, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed Aug. 26, 1974, Ser. No. 500,809
The portion of the term of this patent subsequent to July 6, 1993, has been disclaimed.
Int. Cl.² A61K *31/33*
U.S. Cl. 424—244 **14 Claims**

1. A process for interrupting pregnancy in a pregnant female mammal capable of resorbing an implanted fertilized ovum comprising orally or parenterally administrating to said mammal an interceptive agent during the interceptive stage in an effective dose to cause resorption of said implanted fertilized ovum and said interceptive agent is an aminoketone of the formula

or a pharmaceutically acceptable acid addition salt thereof wherein

R_1 is methyl or ethyl;

R_2 is alkyl of 1 to 3 carbon atoms inclusive,

R_3 is hydrogen, lower alkyl of 1 to 4 carbon atoms inclusive or benzyl;

R_4 is lower alkyl of 1 to 5 carbon atoms inclusive; aralkyl up to 15 carbon atoms inclusive, haloaralkyl up to 15 carbon atoms inclusive; alkyl, 2-propynyl, adamantyl, cycloalkyl of 3 to 6 carbon atoms inclusive; and

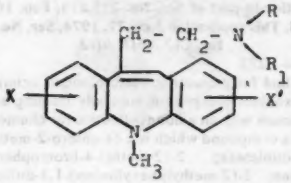
R_3 and R_4 taken together with nitrogen represents morpholino, thiomorpholino, hexahydro-1H-azepinyl or pyrrolidinyl.

3,979,515
NOVEL DIBENZO(B,F)AZEPINES AS THYMOANALEPTICS

André Allais, Les Lilas, and Andre Poittevin, Vaires sur Marne, both of France, assignors to Roussel-UCLAF, Paris, France

Division of Ser. No. 40,410, May 25, 1970, abandoned. This application Dec. 18, 1974, Ser. No. 533,846
Claims priority, application France, May 28, 1969, 69.17373
Int. Cl.² A61K *31/33;* **C07D** *9/00;* **C07F** *9/00*
U.S. Cl. 424—244 **10 Claims**

2. A method of inducing thymoanaleptic activity in warm-blooded animals which comprises administering to warm-blooded animals an amount effective to induce thymoanaleptic activity of a compound selected from the group consisting of 5-methyl-10-(β-alkylaminoethyl) dibenzo (*b,f*) azepine of the formula



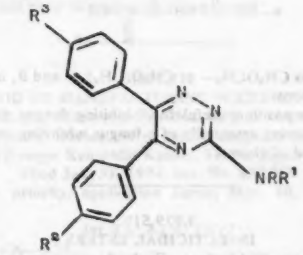
wherein R is lower alkyl, R_1 is selected from the group consisting of hydrogen and lower alkyl and X and X′ are selected from the group consisting of hydrogen and halogen and its non-toxic, pharmaceutically acceptable acid addition salt.

3,979,516
ANTI-INFLAMMATORY 3-AMINO-5,6-DIARYL-1,2,4-TRIAZINES

William B. Lacefield, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 438,158, Jan. 31, 1974. This application June 23, 1975, Ser. No. 589,737
Int. Cl.² A61K *31/53, 31/535*
U.S. Cl. 424—249 **9 Claims**

1. The method of treating inflammation in a warm-blooded animal which comprises orally administering to said animal between 1.0 mg./kg. to 150 mg./kg. of body weight a compound of the formula:



wherein

R and R^1, when taken separately are hydrogen,

C_1–C_3 alkyl or $—CH_2CH(OH)-R^4$, R^4 being hydrogen, methyl or ethyl;

R and R^1, when taken together with the nitrogen atom to which they are attached, are selected from the heterocyclic group consisting of

1. 4-(β-hydroxyethyl)piperazino,

2. 4-hydroxypiperidino
3. 4-methylpiperazino
4. piperidino and
5. pyrrolidino;

R^3 and R^3 are independently C_1–C_3 alkoxy, dimethylamino, fluoro or methylsulfinyl; and a pharmaceutically acceptable acid addition salt thereof; subject to the limitations that

1. when one of R and R^1 is hydrogen, the other is $-CH_2CH(OH)-R^4$;
2. when R^2 is fluoro, R^3 is C_1–C_3 alkoxy; and
3. when R^3 is fluoro, R^2 is C_1–C_3 alkoxy or dimethylamino.

3,979,517

CHEMOSTERILIZATION IXODIDES

Roger Williams Addor, Pennington, and Sidney Kantor, Trenton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 225,278, Feb. 10, 1972, abandoned. This application June 27, 1974, Ser. No. 483,484

Int. Cl.² A01N *9/12*

U.S. Cl. 424—277 **4 Claims**

1. A method for protecting warm-blooded animals against attack by Ixodides comprising, topically treating said warm-blooded animals with an amount effective for chemosterilizing Ixodides of a compound which is 2-(4-chloro-2-methylphenyl-)imino-1,3-dithietane; 2-(2-methyl-4-bromophenylimino)-1,3-dithietane; 2-(2-methylphenylimino)-1,3-dithietane; 2-(2,5-dimethylphenylimino)-1,3-dithietane; 2-(2,4,5-trimethylphenylimino)-1,3-dithietane; 2-(2-methyl-3-chlorophenylimino)-1,3-dithietane; 2-(2,4-dimethylphenylimino)-1,3-dithietane; 2(2,4-dichlorophenylimino)-1,3-dithietane; 2-(2-methoxyphenylimino)-1,3-dithietane; 2-(2-chlorophenylimino)-1,3-dithietane; 2-(2,6-diethylphenylimino)-1,3-dithietane; 2(2-bromo-4-methylphenylimino)-1,3-dithietane or 2-(2-chloro-4-methylphenylimino)-1,3-dithietane.

3,979,518

FUNGICIDAL ALKOXY SUBSTITUTED 2-CYANOACETAMIDE DERIVATIVES

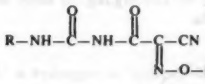
Hein Louis Klopping, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 11, 1975, Ser. No. 612,547

Int. Cl.² A01N *9/20*; C07C *121/417*

U.S. Cl. 424—304 **5 Claims**

1. A compound of the formula



wherein R is CH_3OCH_2— or $CH_3O(CH_2)_3$— and R_1 is alkyl of 1 or 2 carbons.

3. A composition useful for inhibiting fungus disease in plants consisting essentially of a fungus inhibiting amount of a compound of claim 1.

3,979,519

INSECTICIDAL ESTERS

Nazim Punja, Wokingham, England, assignor to Imperial Chemical Industries Limited, London, England

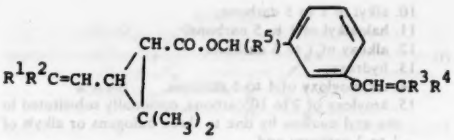
Filed Dec. 5, 1975, Ser. No. 638,282

Claims priority, application United Kingdom, Dec. 5, 1974, 52602/74

Int. Cl.² A01N *9/20, 9/24*; C07C *69/74, 121/75*

U.S. Cl. 424—304 **14 Claims**

1. A compound of formula:



wherein R^1 and R^2 represent halogen radicals or lower alkyl groups; R^3 and R^4 represent halogen radicals; and R^5 represents a hydrogen atom or the cyano radical.

12. An insecticidal composition for use in agriculture or horticulture comprising as an active ingredient a compound according to claim 1 in association with an agriculturally or horticulturally acceptable diluent.

3,979,520

PREPARATION OF RAPIDLY RESORBABLE GLIBENCLAMIDE

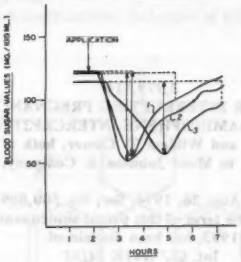
Werner Rothe, Hockenheim; Helmut Heinemann, Heidelberg; Felix Helmut Schmidt, Mannheim-Seckenheim, and Günter Betzien, Mannheim, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

Filed Sept. 20, 1974, Ser. No. 508,001

Claims priority, application Germany, Sept. 26, 1973, 2348334

Int. Cl.² A61K *31/17*

U.S. Cl. 424—321 **5 Claims**



1. A process for the preparation of a blood sugar-lowering composition comprising dissolving glibenclamide in a water-miscible organic solvent, combining said solution with water to precipitate out the glibenclamide with a surface area of about 3 to 10 m^2/g, and combining the precipitated material with about 2 to 100 times its weight of a pharmacologically acceptable dispersion agent.

3,979,521

METHOD FOR THE MANUFACTURE OF FRUIT WINES FROM FRUIT JUICES OF LOW SUGAR CONTENT

Yasuhiro Sakaguchi, Yokohama; Kiyoshi Ishii, and Katumi Kojima, both of Ohimachi, all of Japan, assignors to Daicel Ltd., Osaka, Japan

Filed May 23, 1975, Ser. No. 580,295

Claims priority, application Japan, May 28, 1974, 49-60019

Int. Cl.² C12G *1/00*

U.S. Cl. 426—15 **7 Claims**

1. A method of manufacturing fruit wine, starting with a crude fruit juice containing from about 9 to about 20 percent by weight of sugars and containing hydroxycarboxylic acids and amino acids, which comprises the steps of:

flowing said crude fruit juice in contact with a semi-permeable separation membrane and thereby removing water and from 10 to 60 percent by weight of said hydroxycarboxylic acids and amino acids from said crude fruit juice, and recovering a concentrated fruit juice containing from

about 20 to about 40 percent by weight of said sugars constituting essentially all of the sugars originally present in the crude fruit juice, said concentrated fruit juice also containing the remainder of said hydroxycarboxylic acids and amino acids; inoculating said concentrated fruit juice with a wine-making yeast; fermenting said inoculated concentrated fruit juice to transform same into a fruit wine and aging said wine.

3,979,522

BIOCHEMICAL PROCESS FOR THE SYNTHESIS OF PROTEIN FROM CELLULOSE AND STARCH-CONTAINING PLANTS

Henry L. Scott, 204 E. Houghton, Tuscola, Ill. 61953

Filed Aug. 13, 1975, Ser. No. 604,239
Int. Cl.² A21D *2/00*
U.S. Cl. 426—18 11 Claims

1. A biochemical process for the synthesis of protein from cellulose and starch-containing plants, said plants including a compound containing a CN^- radical, which comprises hydrolyzing the starch therein to sugars, substantially removing said CN^- compound, introducing a food yeast to the mixture and aerobically growing the food yeast on the sugars while introducing ammonia into the mixture during growth of the yeast, said CN^- compound being removed prior to growing the yeast.

3,979,523

REDUCED CALORIE BREAD AND METHOD OF MAKING SAME

Stanley T. Titcomb, Portchester, and Arthur A. Juers, Baldwin, both of N.Y., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed July 30, 1974, Ser. No. 494,011
Int. Cl.² A20D *2/00*
U.S. Cl. 426—19 5 Claims

1. A reduced calorie white enriched bread having fewer calories compared to conventional white enriched bread equal in size and volume, the bread consisting essentially of about 10 parts by weight of wheat gluten, about 5–6 parts by weight of brown sugar, and 22–25 parts by weight of an alpha-cellulose per 100 parts by weight of wheat flour.

3,979,524

METHOD OF COLD STERILIZATION AND PRESERVATION OF FOOD PRODUCTS USING DIMETHYL DICARBONATE

Peter D. Bayne, Shorewood, Wis., assignor to Logica International Corporation, Milwaukee, Wis.

Division of Ser. No. 526,529, Nov. 25, 1974, Pat. No. 3,936,269. This application Jan. 30, 1976, Ser. No. 653,657
Int. Cl.² A23B *4/08, 7/14;* A23L *3/34, 3/36*
U.S. Cl. 426—305 9 Claims

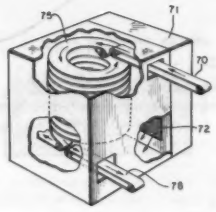
1. A method of cold sterilizing and preserving a perishable food product during shipment and storage, comprising the steps of applying a coating of liquid dimethyl dicarbonate to the outer surface of the food product, cooling the coating to a temperature below 16°C to solidify the coating, said coating acting to protect the food product from spoilage during shipment and storage, and thereafter washing the coating from the food product prior to usage.

3,979,525

PROCESS FOR RETARDING MOLD GROWTH IN PARTIALLY BAKED PIZZA CRUSTS AND ARTICLES PRODUCED THEREBY

Robert F. Plemons, Danville, Ill.; Charles H. Staff, Omaha, Nebr., and J. F. Ross Cameron, Costa Mesa, Calif., assignors to Fairmont Foods Company, Culver City, Calif.

Continuation-in-part of Ser. No. 353,698, April 23, 1973, abandoned. This application May 7, 1975, Ser. No. 575,439
Int. Cl.² A21D *13/00*
U.S. Cl. 426—321 20 Claims



1. A method for increasing the shelf life at room or lower temperatures of partially baked pizza crusts by retarding the growth of viable mold spores on the surfaces of the partially baked pizza crusts, which comprises:

a. partially baking the pizza crusts at a temperature and for a time sufficient to reduce the moisture content of the pizza crusts to between 25% and 50% by weight and to reduce the water activity of the pizza crusts to not greater than 0.96;

b. cooling the partially baked pizza crusts to a temperature below ambient;

c. treating substantially the entire surface of the cooled, partially baked pizza crusts, contaminated on at least some surfaces thereof with viable mold spores, with from 0.001 to 0.02 ml of ethyl alcohol per sq cm of crust surface; and

d. packaging the alcohol treated, partially baked pizza crusts within a period of time following said ethyl alcohol treatment so that vaporization of significant amounts of alcohol prior to packaging is prevented.

3,979,526

METHOD OF MANUFACTURING WHIPPING CREAM

Masao Suzuki; Mitunobu Teshiba, both of Akishima, and Fumio Hara, Hinode, all of Japan, assignors to The Glico Kyodo Nyugyo Kabushiki Kaisha, Tokyo, Japan

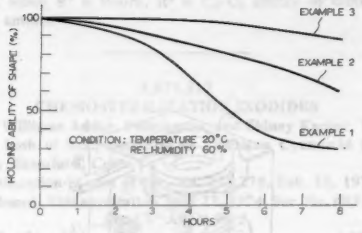
Filed Jan. 31, 1974, Ser. No. 438,289
Claims priority, application Japan, Mar. 10, 1973, 48-28394
Int. Cl.² A23C *13/12*
U.S. Cl. 426—570 7 Claims

1. A method of preparing whipping cream comprising the steps of

A. at least partially removing material having molecular weights less than 10,000 from animal milk using a semi-permeable membrane or a molecular sieve, until there remains a non-fat solids content of between 14.5 to 30 weight percent;

B. homogeneously mixing 50 to 70 parts by weight of the

animal milk remaining after removal of said materials therefrom in step (A), and 50 to 15 parts by weight of oil



or fat; and

C. emulsifying the homogeneous mixture of step (B).

3,979,527

PREPARATION OF HOP OIL

Derek Roy James Laws, and John Anthony Pickett, both of Nutfield, England, assignors to Brewing Patents Limited, England

Filed Apr. 29, 1975, Ser. No. 572,703

Claims priority, application United Kingdom, June 11, 1974, 25944/74; Oct. 8, 1974, 43642/74

Int. Cl.² C12C *3/00*

U.S. Cl. 426—592 **16 Claims**

1. A method for the production of hop oil which comprises steam distilling hop oil in admixture with water from hops under vacuum at a temperature not exceeding 50°C for a period of time sufficient to extract not more than 50% of the total hop oil present in the hops and collecting the distillate at a temperature not exceeding −20°C, thereby substantially reducing undesired hydrocarbons and sulphur containing compounds present in said hop oil.

3,979,528

PRESSURE FIXATION OF COFFEE GRINDER GAS

James P. Mahlmann, Wayne, N.J., assignor to General Foods Corporation, White Plains, N.Y.

Filed May 20, 1974, Ser. No. 471,630

Int. Cl.² A23F *1/04*

U.S. Cl. 426—594 **3 Claims**

1. A method for aromatizing soluble coffee comprising the steps of:

a. condensing, as a frost, an aroma-containing gas which has a high carbon dioxide content,

b. placing the aroma-containing frost in a pressure vessel,

c. placing liquid glyceride in the vessel at a level of one gram of glyceride to 0.5 to 6 grams of aroma frost, isolating the pressure vessel and increasing the temperature within the vessel to a temperature of about 70°–75°F such that the pressure within the vessel increases to above 100 psia and a liquid CO_2 phase which contains aroma is formed,

d. removing the glyceride from the vessel and combining it with coffee solids.

3,979,529

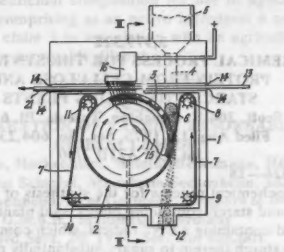
ELECTROSTATIC APPLICATION OF THERMOPLASTIC ADHESIVE

Hans W. Rebentisch, Frankfurt, and Gerhard W. Steinmeyer, Hunoldstal, Trunus, both of Germany, assignors to USM Corporation, Boston, Mass.

Division of Ser. No. 392,034, Aug. 27, 1973, Pat. No. 3,881,447. This application Jan. 16, 1975, Ser. No. 541,652

Int. Cl.² B05D *1/06*

U.S. Cl. 427—25 **4 Claims**



1. A method of applying a powder-melt adhesive in the form of a strip to a backing material, which strip is to be subsequently used to adhere the backing, comprising the steps of:

depositing the powder-melt adhesive onto a moving member having an electrode integral therewith;

providing a stationary electrode along the path of said moving member downstream of the point of adhesive deposit and in spaced relation with the powder melt adhesive on the member;

feeding the backing through the space between said stationary electrode and the powder-melt adhesive;

continuously applying a voltage of predetermined polarity to the integral electrode at least during the travel of said moving member from the point of depositing the powder-melt adhesive on the member to the point of positioning of the powder-melt material proximate the stationary electrode; and

applying a voltage of opposite polarity to the stationary electrode such that, from the point of deposit of the powder-melt adhesive on the member to a point proximate the stationary electrode the powder melt adhesive is subjected to a substantially constant high tension field and the adhesive is subjected to a reversal of polarization when proximate the stationary electrode to extract the adhesive from the member and draw the adhesive from the member to the backing.

3,979,530

POLYESTER FIBER-VACUUM IMPREGNATED EPOXY RESIN INSULATION SYSTEM FOR HIGH VOLTAGE TRANSFORMERS

Alfred W. Schwider, Pacific Palisades; John Burnham, Los Angeles, and Robert S. Buritz, Pacific Palisades, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 15, 1974, Ser. No. 461,071

Int. Cl.² H02K *15/12*

U.S. Cl. 427—104 **3 Claims**

1. A process for making a polyester-filled epoxy resin electrical insulation system comprised of epoxy-impregnated chopped polyester fibers which includes the steps of applying a porous fiber mat to an electrical device to be insulated, vacuum baking said fibers at 100 to 110°C for at least 16 hours and then placing said device into a suitable impregnation container heated to 90° to 110°C, wherein said impregnation chamber is evacuated to a pressure of 30 μHg or less, said epoxy resin is heated to 75° ± 5°C and degassed at a pressure of 700 μHg or less prior to addition of a nonstoichiometric

hardener, comprised of a mixture of menthane diamine, metaphenylene diamine, and benzyldimethylamine, said hardener is added to said resin at 75 ± 5°C mixed thoroughly and degassed thereby forming a curable resin system, said resin system is introduced into said impregnation chamber whereby all fibers to be impregnated are completely covered by said resin system, said impregnated fibers are removed from said

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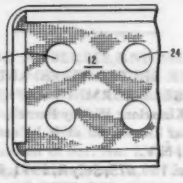
3,979,531
FLUIDIZED BED TOP SURFACE STABILIZATION MECHANISM

Arthur D. Heller, Horseheads, N.Y., assignor to Dart Industries Inc., Los Angeles, Calif.

Continuation of Ser. No. 272,700, July 17, 1972, abandoned. This application May 22, 1974, Ser. No. 472,006
Int. Cl.² B05D *1/12, 1/24*
U.S. Cl. 427—185 **2 Claims**



1. In a method of coating an article by means of a fluidized bed coating technique wherein a fluidization chamber is utilized having impervious side walls, a gas pervious distributor plate adapted to support a bed of pulverulent coating materials, an open top, and having means for passing fluidizing gases upwardly through said gas distributor plate to fluidize said pulverulent materials, the improvement comprising:

a. providing a generally horizontally disposed means of a generally perforate configuration and including at least one enlarged opening therein of sufficient size to accommodate the passage of an article therethrough for total or partial immersion in said fluidized bed,

b. positioning said horizontally disposed means and controlling the pulverulent coating materials and the fluidizing gases in a manner such that said horizontally disposed means will engage only the upper most surface of the fluidized pulverulent coating materials, said horizontally disposed means and said pulverulent coating materials being below the top of the impervious side walls of said fluidization chamber,

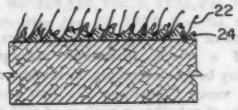
c. emersing an article in said fluidized bed by inserting it through said enlarged opening for a time sufficient to coat said article and then withdrawing it from said opening.

3,979,532
PROCESS FOR THE MANUFACTURE OF ARTIFICIAL LEATHER AND PRODUCT MADE THEREBY

Eduard Mück, Otrokovice; Josef Horak, Gottwaldov, both of Czechoslovakia; Jaroslav Strachota, deceased, late of Veselí nad Moravou, Czechoslovakia (by Vera Strachotova, legal representative); Jiri Boleslav, Gottwaldov, Czechoslovakia; Lubomir Grygera, Gottwaldov, Czechoslovakia; Ladislav Bogdanovicz, Hradiste, Czechoslovakia, and Otto Hvezda, Otrokovice, Czechoslovakia, assignors to Statni vyzkumny ustav kozedelny, Czechoslovakia

Continuation-in-part of Ser. No. 238,603, March 27, 1972, abandoned. This application Aug. 30, 1973, Ser. No. 393,199
Claims priority, application Czechoslovakia, Apr. 30, 1971, 3150-71
Int. Cl.² B05D *5/00;* D06C *11/00*
U.S. Cl. 427—245 **13 Claims**

1. A process for the manufacture of artificial leather and for imparting a napped, or nubuck grain finish thereto comprising the steps of providing a backing member comprising a matrix of crossing strands of fibers, contacting at least one side of said backing member with a polymeric system comprising a mixture of a heat-reactive latex and a carboxylated latex, the latter being self-cross-linkable at a more rapid rate than the former under application of heat, at a temperature in a range of about 60°C. to about 135°C., subjecting said contacted backing member to a temperature within said range for a period of time to effect sequential cross-linking of said carboxylated latex about the points of crossing of said strands and of said heat-reactive latex about said cross-linked carboxylated latex and drying of the contacted backing member, and thereafter buffing said one side in two steps, the direction of the second buffing step being shifted an angle of 180° from the



first buffing step thereby mechanically altering said one side of the dried backing member to provide an irregular leather-like surface thereto consisting of elongated fibers from said backing member and shorter villi of said cross-linked, heat-reactive latex.

13. An artificial leather comprising a fabric base having crossing strands of fibers, wherein a carboxylated latex is cross-linked at the intersection of said crossing strands to bind the fabric together, and a heat-reactive latex is cross-linked about said cross-linked, carboxylated latex, and having elongated fibers from said base and shorter villi of said cross-linked, heat-reactive latex extending from the plane of said fabric to provide an irregular leather-like surface having a napped finish.

3,979,533
α,α′-BIS-(PHOSPHONO)DICARBOXYLIC ACID DERIVATIVES

Jerry P. Moreau; Leon H. Chance; Gordon J. Boudreaux, all of New Orleans, and George L. Drake, Jr., Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 311,609, Dec. 4, 1972, Pat. No. 3,933,944. This application Oct. 30, 1975, Ser. No. 627,326
Int. Cl.² C07F *9/40;* B05D *3/02*
U.S. Cl. 427—390 **2 Claims**

1. A process for imparting to cotton and other cellulosic textiles the properties of wrinkle resistance and flame retardance, the process comprising:

a. mixing 1 mole of αα′-bis(diethylphosphono)adipamide with about 5 moles of formaldehyde while maintaining the pH greater than 7 with aqueous sodium carbonate and the temperature at about 75°C until the amide compound is completely dissolved,

b. diluting the mixture with water to obtain a 20% concentration, based on the initial weight of the amide,

c. adding about 2% of $Zn(NO_3)_2.6H_2O$ catalyst to the dilute solution of (b),

d. impregnating a cellulosic fabric to a wet pickup of about 75% with the solution of (c),

e. drying the impregnated fabric for about 5 minutes at about 85°C, and

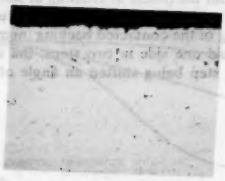
f. curing the wet impregnated fabric for about 7 minutes at about 160°C.

3,979,534

PROTECTIVE COATINGS FOR DISPERSION STRENGTHENED NICKEL-CHROMIUM/ALLOYS

John R. Rairden, III, Niskayuna, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed July 26, 1974, Ser. No. 492,070
Int. Cl.² B05D *1/38*; C23C *11/00*
U.S. Cl. 427—405 5 Claims



1. A method of improving the high temperature oxidation resistance of a thoria dispersion strengthened nickel-chromium alloy body comprising, in sequence the steps of:

a. physical vapor deposition of a first coating consisting essentially of cobalt to a surface of said body,

b. heat treating the coated body to a temperature sufficient to diffuse at least a portion of the first coating into the surface of said body, and

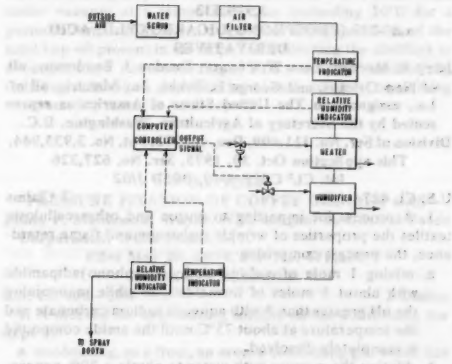
c. subjecting the coated body to a pack cementation vapor deposition to form a second coating comprising aluminum on said body, said second coating being substantially nonporous and adherent to said body.

3,979,535

PROCESS FOR THE SPRAY APPLICATION OF AQUEOUS PAINTS BY CONTROLLING THE TEMPERATURE OF THE AIR IN THE PAINT SPRAY ZONE

Tirunillayi S. Govindan, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 384,360, July 31, 1973, abandoned. This application July 30, 1975, Ser. No. 600,365
Int. Cl.² B05D *1/02*
U.S. Cl. 427—422 10 Claims



1. In a process for applying an aqueous dispersion or solution paint to a substrate by air-spraying the paint with a spray gun utilizing atomizing air at a flow rate of 5–40 cubic feet per minute and at an air pressure of 30–95 pounds per square inch at the spray gun and a paint flow rate of 5–30 ounces per minute which forms an air atomized paint spray which is applied to the substrate and baked at about 75° to 200°C. to form a uniform finish on the substrate, the improvement in use therewith comprising:

spraying the atomized paint in an air atmosphere that is controlled by the addition of steam or water at a temperature of 15°–40°C. and at such a relative humidity that the air has a driving force value in the range of 0.002 to 0.004 humidity units which is constantly maintained at a set value within this range, thereby providing an atmosphere for initally drying the aqueous paint during the spraying at a uniform rate to provide a finish that has a uniform appearance after being baked;

wherein the paint is an aqueous thermosetting acrylic enamel in which the film-forming constituents of the enamel comprise:

1. an acrylic polymer of styrene, methyl methacrylate or a mixture thereof, an alkyl acrylate or an alkyl methacrylate having 2–12 carbon atoms in the alkyl group, optionally a hydroxy alkyl acrylate or a hydroxy alkyl methacrylate and an α,β-unsaturated carboxylic acid; and

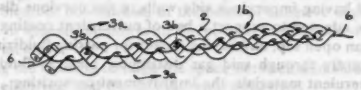
2. a water soluble or water-dispersible cross-linking agent.

3,979,536

ZERO DEGREE BELTED TIRES, AND HIGH "SOFT STRETCH" BELT-FORMING TAPES THEREFOR

James J. Neville, Kinnelon; Wesley Ferrell, Wayne, and Daniel Shichman, Cedar Grove, all of N.J., assignors to Uniroyal Inc., New York, N.Y.

Division of Ser. No. 160,675, July 8, 1971, Pat. No. 3,956,546. This application Jan. 17, 1975, Ser. No. 542,024
Int. Cl.² B29H *17/00*
U.S. Cl. 428—43 73 Claims



1. A high soft stretch tape of reinforcing cord for a molded elastomeric article intended to undergo an expansion of at least about 20% after incorporation of the tape therein, comprising:

I. a first subtape including

A. at least one reinforcing cord,

1. said cord having a multiplicity of undulations therein

2. which in any given straight length of said first subtape are substantially planar,

3. whereby said first subtape can be elongated, without any stretching of said cord thereof, by straightening of the latter to remove said undulations therefrom, and

4. said cord being locally weakened at a multiplicity of longitudinally spaced portions thereof, and

B. relatively weak tying means

1. acting on said cord and

2. releasably holding the same in the undulating state thereof,

3. said tying means being constructed

a. to hold said cord against straightening out under moderate forces such as are applied to said first subtape in normal handling thereof

b. but to yield and permit said cord to straighten out under appreciably higher forces such as are applied to said first subtape when the same is incorporated in said article and the latter undergoes an expansion;

II. and at least one additional substantially identical subtape disposed in side by side abutting relation with said first subtape,

A. the plane of said undulations of said cord of each additional subtape being substantially parallel to the plane of said undulations of said cord of said first subtape,

B. at least one of each two adjacent subtapes being provided on the cord thereof abutting against the other of such two adjacent subtapes with a coating of a tacky substance to

enable such subtapes to adhere to each other so as to form a composite tape having a higher number of component cords, and

C. said weakened portions in each of said abutting cords being out of lateral alignment with the weakened portions of the other of said abutting cords;

III. the magnitude of said undulations of said cord in each subtape being predetermined to provide a composite tape stretch ratio, defined as the ratio of the length of each cord when unstretched but fully straight to the length of the composite tape when said cords are undulated, which is at least about 1.2, which is no greater than substantially equal to the expansion ratio of said article, defined as the ratio of a given dimension of said article after the same is expanded to the corresponding dimension of said article before the same is expanded, and which is no smaller than said expansion ratio less approximately the capability of said cords to elongate by strain, by partial untwisting, and by rupture at said weakened portions.

3,979,537

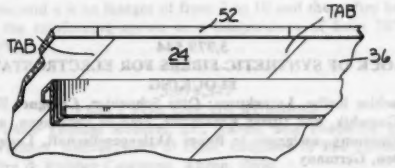
INSULATING MATERIAL AND METHODS OF MANUFACTURE

Richard Lloyd Troyer, Maumee, Ohio, assignor to Johns-Manville Corporation, Denver, Colo.

Continuation of Ser. No. 407,322, Oct. 17, 1973, abandoned, which is a continuation of Ser. No. 130,345, April 1, 1971, abandoned. This application June 30, 1975, Ser. No. 591,584

Int. Cl.² E04B *1/62;* **B32B** *3/10*

U.S. Cl. 428—61 **4 Claims**



1. A continuous insulating layer having at least one finished seam free of adhesive, staples, or other fastening means, which seam provides a vapor barrier, said layer being supported by supports 4–6 feet apart and running transversely of said seam, said layer and seam comprising:

a. a longitudinal edge of a first resilient blanket of fibers comprised of glass bonded together and having a density in the range of about 1–2 lbs/cu. ft., said blanket being faced on the major face adjacent to said supports with a flexible vapor impervious facing sheet having an edge that essentially coincides with said longitudinal edge to form a first panel, said panel being semi-rigid to have minor sag when so supported, and

b. a longitudinal edge of a second resilient blanket having the major surface adjacent to said supports faced with a vapor impervious facing to form a second panel having essentially the same characteristics as said first panel, said facing on said second blanket extending beyond said longitudinal edge to form a tab, the first and second blankets being butted together along said longitudinal edges such that the tab overlaps the facing on said first resilient blanket to form said seam, strip reinforcement means adhered to said tab and located on that portion of the tab contacting the facing on the adjoining blanket to provide the tab with greater resistance to sagging than the remainder of the insulating layer resulting in the tab being pulled closer against the facing of the adjacent panel to form said sealed seam, the width of said strip reinforcement means being greater than the width of said tab so that said strip reinforcement means overlaps a portion of said second resilient blanket.

3,979,538

FLOCKED WEB AND METHOD OF PRODUCING SAME

Charles M. Gilman, Gilman; Bruce R. Borgersen, North Franklin, and Lawrence M. Gilman, Gilman, all of Conn., assignors to The Gilman Brothers Company, Gilman, Conn.

Filed Feb. 13, 1975, Ser. No. 549,467

Int. Cl.² B32B *3/26*

U.S. Cl. 428—90 **11 Claims**

10. A flocked web comprising a porous cloth fabric substrate, a collapsed porous foam layer superimposed on and adherent to a face of said substrate, a plurality of closely spaced resin dots adherent to said foam layer, and flock fibers extending from and anchored to said dots.

3,979,539

SHEET MOLDING COMPOUND

Richard L. Jeanson, Watertown, Wis., assignor to Menasha Corporation, Neenah, Wis.

Division of Ser. No. 329,524, Feb. 5, 1973, Pat. No. 3,874,973. This application Jan. 20, 1975, Ser. No. 542,125

Int. Cl.² B32B *3/04*

U.S. Cl. 428—126 **3 Claims**

1. A composite sheet molding structure, comprising a film of plastic sheet material, a mixture of a relatively viscous uncured thermosetting resin and a finely divided fibrous material disposed as a layer on said film, said film having a side portion folded over the layer in a generally S-shaped fold extending substantially the length of the sheet and providing a first folded portion overlaying and in contiguous relation to said layer and a second folded portion overlaying and in contiguous relation to said first folded portion, said first folded portion serving as a dam to prevent said resin from being ejected from the side edges of the structure when said structure is subjected to pressure, and said second folded portion comprising a projecting tab to failicate removal of said film from said layer.

3,979,540

IONOMER RESIN SUBSTRATES COATED WITH AN EPOXY PRIMER AND FINISHED WITH AN ACRYLIC COATING

Walter K. Moffett, Birmingham, Mich., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 22, 1975, Ser. No. 643,394

Int. Cl.² B32B *3/26*

U.S. Cl. 428—159 **15 Claims**

1. A coated, flexible substrate consisting essentially of

a. a layer of a foamed ionomer resin or of a foamed polyolefin resin,

b. a top layer of an ionomer resin firmly adhered to said foamed layer,

c. an epoxy primer layer firmly adhered to the top layer and

d. an acrylic coating layer in firm adherence to the primer layer.

3,979,541

THIN BASE SELF-TRACKING RECORDING TAPE

Robert I. Desourdis, 265 Gay Road, Warrenton, Va. 22186

Division of Ser. No. 332,288, Feb. 14, 1973, Pat. No. 3,893,181. This application Feb. 27, 1975, Ser. No. 553,614

Int. Cl.² B32B *3/28;* **B05D** *5/12*

U.S. Cl. 428—181 **9 Claims**

1. A thin base recording tape capable of being stored in interlocked layers comprising:

an accordian pleated flexible substrate having a photosensitive or magnetic coating on at least one side thereof, said substrate with said coating on at least one side thereof being accordian pleated in such a manner that said tape has a plurality of V-shaped grooves formed on both sides thereof, said plurality of grooves on one side of said tape being separated from each other by the V-shaped projections formed by said V-shaped grooves formed in other side of said tape, said V-shaped grooves and said V-

shaped projections being so dimensioned relative to each other that said V-shaped projections and said V-shaped grooves will interlock with each other when said tape is folded over on itself.

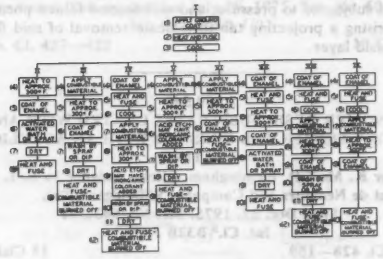
2. A thin base recording tape as defined in claim 1 wherein a storage reel is provided and said thin base recording tape is wound on said reel, said V-shaped projections interlocking with said V-shaped grooves of each preceding layer to lock said thin base tape on said reel.

3,979,542

DECORATIVE PORCELAIN ENAMEL SURFACE AND METHOD FOR MAKING

John C. Perantoni, and Myron E. Ullman, Jr., both of Canfield, Ohio, assignors to American Standard, Inc., New York, N.Y.

Filed Sept. 26, 1974, Ser. No. 509,324
Int. Cl.² B32B *15/04;* B28B *21/44*
U.S. Cl. 428—204 1 Claim



1. An article having a decorative fused and vitrified porcelain enamel finish on a metal panel, said finish at least two layers comprising:

a ground coat consisting of porcelain enamel paste in water having a first color applied to said metal panel over the entire surface thereof and fused by heating to fusing temperature and a porcelain enamel finish coat fused to said ground coat of a different color than said first color and distributed on said ground coat in randomly spaced areas to provide a variegated pattern resembling marble,

said finish coat consisting of porcelain enamel paste in water and inorganic colorant unevenly distributed after fusing to produce a fired finish coating having areas of differing thicknesses over said ground coat to thereby provide a variegated pattern of non-uniform thickness.

3,979,543

ARTICLE HAVING A POLY(ARYLENE SULFIDE) COATING AND METHOD OF PRODUCING

David E. Higbee, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 369,608, June 13, 1973, Pat. No. 3,894,983. This application May 14, 1975, Ser. No. 577,494
Int. Cl.² B32B *19/02*
U.S. Cl. 428—331 10 Claims

1. A coated article comprising a substrate having a coating bonded thereto of a composition comprising a normally solid poly(arylene sulfide) and from about 0.3 percent to about 4 percent by weight, based on the weight of poly(arylene sulfide), of a finely divided siliceous material having a particle size less than about 10 microns.

7. The method of producing a glossy poly(arylene sulfide) coating of substantially uniform thickness comprising:

covering the surface of the article to be coated with a slurry containing poly(arylene sulfide) and from about 0.3 to about 4 weight percent of a finely divided siliceous material having a particle size less than about 10 microns, based on the weight of poly(arylene sulfide); and

curing the thus-covered surface in oxygen-containing atmosphere at a temperature within the range of about 500° F. to about 900° F. for a period of time within the range of about 5 minutes to about 12 hours.

3,979,544

FLOCK OF SYNTHETIC FIBERS FOR ELECTROSTATIC FLOCKING

Joachim Kolbe, Leverkusen; Otto Schneider, Cologne; Ernst Gutschik, and Dieter Brokmeier, both of Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 9, 1975, Ser. No. 584,846
Claims priority, application Germany, July 2, 1974, 2431847; Nov. 28, 1974, 2456309
Int. Cl.² B32B *9/00, 27/00;* D02G *3/00*
U.S. Cl. 428—361 5 Claims

1. Synthetic fiber flock selected from the group consisting of viscose-, polyacrylonitrile-, polyester-, and polyamide fibers, containing a mineral tanning agent selected from the group consisting of zirconium sulfate, $Zr(OH)_2SO_4+SiO_3\cdot H_2O+Na_2SO_4$ and $ZrOCL_2$.

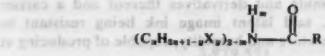
3,979,545

SYNTHETIC FIBER IMPREGNATED WITH FLAME RETARDANT COMPOSITIONS CONTAINING HALOGEN CONTAINING AMIDES

Harry Braus, Cincinnati, Ohio, and Jay R. Woltermann, Memphis, Tenn., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Sept. 12, 1974, Ser. No. 505,287
Int. Cl.² B32B *9/00;* D02G *3/00*
U.S. Cl. 428—392 4 Claims

1. A synthetic fiber of improved flame resistance which comprises said synthetic fiber impregnated with an effective flame resistant amount of a halogen containing amide of the formula



wherein R is lower alkoxy, lower alkoxy carbonyl,

X is chlorine or bromine; *m* is 0 or 1; *n* is 1–6; and *y* is 1–13.

3,979,546

ALKOXYSILOXANOL MODIFIED SURFACES

Richard Newton Lewis, Tecumseh, Mich., assignor to SWS Silicones Corporation, Adrian, Mich.

Division of Ser. No. 214,406, Dec. 30, 1971, Pat. No. 3,799,962. This application Jan. 21, 1974, Ser. No. 435,151

Int. Cl.² B32B *27/00*; D02G *3/00*

U.S. Cl. 428—394 **4 Claims**

1. A method of modifying the surfaces of reinforcing agents, selected from the group consisting of siliceous fillers and fibrous materials which comprises contacting the surfaces of said reinforcing agents wih an alpha-alkoxyomega-siloxanol of the formula $R'O(R_2SiO)_xH$, in which R is selected from the group consisting of hydrocarbon radicals, halogenated hydrocarbon radicals and cyanoalkyl radicals having up to 8 carbon atoms, R' is the radical of an alcohol having up to 20 carbon atoms and *x* is an integer of from 2 to 10 and thereafter heating the reinforcing agents to a temperature of from 50° to 200°C.

3,979,547

PAINT FOR USE ON RUBBERS

Durward Thomas Roberts, Jr., Akron, and Frederick Carl Weissert, Bolivar, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Mar. 20, 1975, Ser. No. 560,265

Int. Cl.² C08L *75/04*

U.S. Cl. 428—423 **7 Claims**

1. In a cured rubber surface to which is adhered a solid coating of a polyurethane prepolymer derived from a polyol and an isocyanate, which prepolymer is cured with an amine curing agent and contains an adhesion promoter, the improvement in which in the coating, there is 3 to 10 parts of a polystyrene-polybutadiene-polystyrene block copolymer to prevent the coating from orange-peeling.

3,979,548

POLYURETHANE COATED SAFETY GLASS

Wolfgang Schäfer, and Helmer Raedisch, both of Aachen, Germany, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Nov. 12, 1974, Ser. No. 523,016

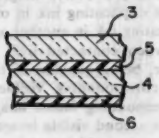
Claims priority, application France, Nov. 16, 1973, 73.40821

Int. Cl.² B32B *27/40*

U.S. Cl. 428—425 **2 Claims**

1. A safety window comprising at least one glass sheet having bonded thereto an adherent solid transparent layer of a scratch-resistant polyurethane formed by curing a liquid mixture containing (1) a polyglycol ether resulting from the condensation of propylene oxide with trimethylolpropane and containing about 10.5–12% by weight free hydroxyls together with (2) a biuret of 1,6-hexamethylene diisocyanate having about 21–22% by weight isocyanate groups, the weight of said biuret being between about 0.9 and 1.1 times the weight of said polyglycol ether.

2. A safety glass laminate of a plurality of solid glass sheets having disposed between adjacent sheets an adherent, transparent solid interlayer of polyvinylbutyral and having bonded to at least one outer glass sheet of this laminate an adherent solid transparent layer of scratch-resistant polyurethane formed by curing a liquid mixture containing (1) a polyglycol



ether resulting from the condensation of propylene oxide with trimethylolpropane and containing about 10.5–12.0% by weight free hydroxyls together with (2) a biuret of 1,6-hexamethylene diisocyanate having about 21–22% by weight isocyanate groups, the weight of said biuret being between about 0.9 and 1.1 times the weight of said polyglycol ether.

3,979,549

COMPOSITE OF METAL AND THERMOSET PLASTIC

Robert E. Wilkinson, Lafayette, Ind., assignor to Rostone Corporation, Lafayette, Ind.

Division of Ser. No. 292,188, Sept. 25, 1972, Pat. No. 3,844,030. This application July 8, 1974, Ser. No. 486,664

Int. Cl.² H01B *1/04*; B32B *27/40*, *27/36*

U.S. Cl. 428—450 **6 Claims**

1. An integrally bonded composite comprising a metal substrate having a surface, a thermoset elastomer layer bonded to said surface over an extended area thereof and containing an organosilane coupling agent for bonding said layer to an ethylenically-unsaturated thermosetting resin composition molded and cured in place against said layer, and a body of fiber-reinforced thermoset ethylenically-unsaturated resin composition molded and cured in place under heat and pressure against said elastomer layer and chemically bonded thereto by said coupling agent.

3,979,550

PRE-PRINTED LATENT IMAGE SPIRIT DUPLICATING MASTERS

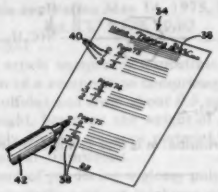
Irving Panken, Dayton, Ohio, assignor to The Mazer Corporation, Dayton, Ohio

Continuation of Ser. No. 434,559, Jan. 18, 1974, abandoned. This application Dec. 10, 1975, Ser. No. 639,351

Int. Cl.[2] B41M 5/04

U.S. Cl. 428—488 **18 Claims**

1. A pre-printed spirit duplicating master comprising a sheet having reverse printed on the backside thereof by means of a printing technique selected from the group consisting of offset, rotogravure, letterpress, stencilling, or aniline printing, a visible image spirit duplicating ink in one area and a latent image spirit duplicating ink in another area, both said visible and latent inks, when contacted with an alcohol or spirit wetted copy paper, being capable of transfer to said copy paper to impart corresponding visible and latent images thereon, said corresponding latent image being capable of development into a second visible image by application of a color developer thereto, said latent image spirit duplicating ink containing a color former selected from the group consisting of dithiooxamide and derivatives thereof and a carrier vehicle therefor, said latent image ink being resistant to changes in temperature and humidity, capable of producing at least 100 acceptable copies and capable of making copies with little or no loss of intensity in the developed image after being stored for a period of at least up to 1 year.

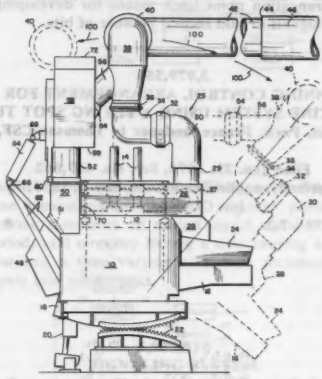


ELECTRICAL

3,979,551
ARC FURNACE FUMES CONTROL SYSTEM

Robert C. Overmyer, and Pramodh Nijhawan, both of Indianapolis, Ind., assignors to Hawley Manufacturing Corporation, Indianapolis, Ind.

Filed Sept. 24, 1975, Ser. No. 616,155
Int. Cl.[2] F27D *17/00*
U.S. Cl. 13—10 **14 Claims**



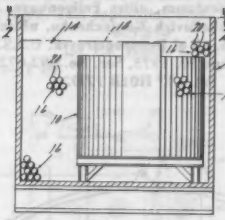
1. A fumes control system for an electric arc furnace comprising a crucible providing an upwardly directed mouth, a roof covering said mouth, said roof being movable into an opening position away from said mouth, a plurality of arc electrodes extending downwardly through said roof, said crucible having at least one pouring spout opening therein and being tiltable for tapping and for removing slag therefrom, said control system comprising exhaust means, first hood means for collecting fumes generated during furnace operations from said roof, first conduit means for connecting said first hood means to said exhaust means, said first hood means being movable with said roof to expose said mouth, said first conduit means providing for such movement of said first hood means, and charging hood means for covering said mouth when said first hood means and said roof are moved away from said mouth, said charging hood means having a use position covering said mouth and a storage position away from said mouth, means for supporting said charging hood means for movement between said positions, second conduit means for connecting said charging hood means to said exhaust means when said charging hood means is in said use position, and said charging hood means having an opening therein through which said crucible is charged with metal to be melted.

3,979,552
COOLANT DISPLACEMENT MATERIAL

John L. Fisher, Lexington, Ky., assignor to Kuhlman Corporation, Troy, Mich.

Filed Mar. 11, 1974, Ser. No. 449,639
Int. Cl.[2] H01F *27/12*
U.S. Cl. 174—15 R **11 Claims**

1. In combination with a transformer and a tank for containing a coolant liquid for cooling the transformer, cooling means within said tank comprising a coolant liquid and a plurality of members having at least one closed void therein, said members being spherical and constructed of a material which is substantially chemically inert with respect to said coolant liquid and which has a good dielectric characteristic to avoid dielectric breakdown in the high voltage environment of said transformer, said closed void being filled with an inert gas, the ratio of the volume of said material and the volume of said one or more closed voids in each of said members being established to provide a specific gravity of between 1.0 and 1.8, and said spherical members providing venturi-like flow passages

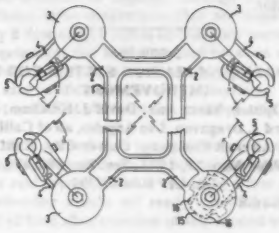


for providing increased flow velocities of said coolant liquid to enhance thermal transfer from said transformer to said coolant liquid, being unresilient, and having a diameter between ½ inches and 1½ inches.

3,979,553
SPACER-DAMPERS FOR POWER TRANSMISSION LINES

Thomas John Smart, Oadby, England, assignor to Dunlop Limited, London, England

Filed Dec. 9, 1974, Ser. No. 531,073
Claims priority, application United Kingdom, Dec. 13, 1973, 57940/73
Int. Cl.[2] H02G *7/14, 7/12*
U.S. Cl. 174—42 **9 Claims**



1. A spacer-damper for an overhead power transmission line having at least three subconductors per bundle, comprising:

a. a rigid frame means;

b. a plurality of rigid arm means for supporting, respectively, the subconductors, each of said rigid arm means having, at one end, a clamp means for attachment to a respective subconductor, said rigid arm means being spaced apart from one another, at least two of said arm means extending in the rest position of the spacer-damper so that, for each of said two arm means, a line between said clamp means and the other end of said arm means is in a direction extending generally perpendicular to a plane including the axis of the rigid frame means and the center line of a respective clamp means; said rigid frame means providing attachment points at which said other end of each said arm means is attached; and

c. a plurality of resilient damping means for damping movement of the respective subconductors in said plane, in a vertical direction and in a horizontal direction, each of said resilient damping means being located between said other end of one of said arm means and said frame means

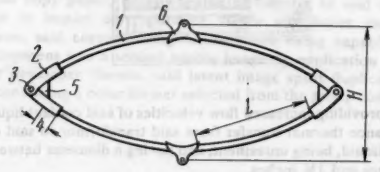
at one of said attachment points and having a pivotal axis lying parallel to the axis of the clamp means.

3,979,554

SUSPENSION INSULATOR

Leonid Nikolaevich Fesik, ulitsa Furmanova, 1, kv. 61; Lev Fedorovich Kovtun, ulitsa Zhukovskogo, 4a, kv. 11; Igor Georgievich Lindenbaum, ulitsa Poligonnaya, 22, kv. 48, and Mikhail Mikhailovich Konjuchenko, ulitsa Jurla Savchenko, 37, kv. 6, all of Dnepropetrovsk, U.S.S.R.

Filed June 30, 1975, Ser. No. 592,072
Int. Cl.[2] H01B *17/02*
U.S. Cl. 174—177 2 Claims



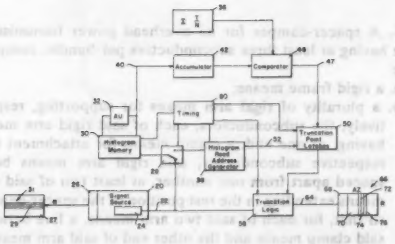
1. A suspension insulator for insulating wires of a power transmission line suspended from cross-arms of line supports, comprising two straight insulation members of elastic material arched and joined together so that their convex sides face outwardly, the ends of said members being rigidly interconnected by metal end-pieces for maintaining the insulation members in an arched condition in the form of a spring suspension, clamp means provided at the middle of one of said members for attaching the insulator to a cross-arm of a power line support and clamp means provided at the middle of the other of said members for attaching a power transmission line to the insulator.

3,979,555

HISTOGRAM EQUALIZATION SYSTEM FOR DISPLAY IMPROVEMENT

Eugene W. Opittek, Santa Ana; David J. Ketcham, Lakewood, and Edward J. Dragavon, Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 27, 1975, Ser. No. 582,478
Int. Cl.[2] H04N *3/00*
U.S. Cl. 178—6.8 10 Claims



1. A system responsive to a signal source of amplitude data of a first number of bits to develop a truncated signal having a second and lesser number of bits comprising:

a histogram memory addressable with the value of said amplitude data for storing at each address the number of address occurrences during a first period,

read address generator means coupled to said histogram memory for applying sequential addresses thereto during a second period,

accumulating means coupled to said histogram memory for accumulating the number of occurrences read from said memory, during said second period,

comparator means coupled to said accumulator means for responding when the accumulated occurrences equals a predetermined value equal to a selected fraction of the signals addressing said memory during said first period,

truncation point latch means coupled to said comparator and to said read address generator for storing the truncation points; and

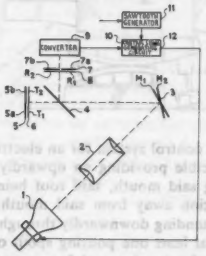
truncation logic means coupled to said signal source and to said truncation point latch means for developing truncated signals of said second number of bits.

3,979,556

SCANNING CONTROL ARRANGEMENT FOR A TELECINE SYSTEM USING A FLYING SPOT TUBE

Serge Vidal, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 29, 1974, Ser. No. 437,662
Claims priority, application France, Feb. 2, 1973, 73.03715
Int. Cl.[2] H04N *3/36*
U.S. Cl. 178—7.2 8 Claims



1. An arrangement for controlling the vertical deflection of the spot in a flying spot tube having vertical deflection means, in order to effect correct optical scanning, line by line, of a surface within a fixed frame, said arangement comprising: stationary marker zones located for being scanned by an image of said spot during said optical scanning, said marker zones being designed for supplying, when scanned by said image of said spot, optical marker signals which are characteristic of the position, in the vertical scanning direction, of the line being scanned within said fixed frame; a converter for converting said marker signals into electrical signals; a reference signal generator; a circuit for receiving the signals from said converter and from said reference signal generator and for delivering an error signal characteristic of said position; and means coupled to said circuit and to said vertical deflection means for correcting said vertical deflection as a function of said position.

3,979,557

SPEECH PROCESSOR SYSTEM FOR PITCH PERIOD EXTRACTION USING PREDICTION FILTERS

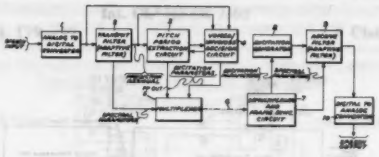
Richard J. Schulman, Englishtown, and Mark J. Schneider, Nutley, both of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Continuation-in-part of Ser. No. 485,487, July 3, 1974, abandoned. This application July 3, 1975, Ser. No. 593,138
Int. Cl.[2] G10L *1/00*
U.S. Cl. 179—1 SA 12 Claims

1. A digital pitch period extraction circuit for a digital vocoder having a digital adaptive filter providing a multiple fit digital prediction residual for each sample, said extraction circuit comprising:

a squarer coupled to said adaptive filter to square said residual;

a digital low pass filter coupled to said squarer to low pass filter said squared residual; and logic circuitry coupled to said low pass filter to locate sharp pitch peaks in the



output signal of said low pass filter and to determine the time separation between two adjacent pitch peaks to provide therefrom an output signal equal to the pitch period, said circuitry having a time moving search window and a time varying amplitude threshold level to locate said pitch peaks.

3,979,558

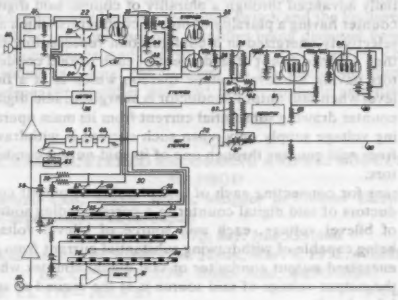
SIGNALING SYSTEM

Eugene Peterson, New York, N.Y., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 30, 1944, Ser. No. 542,922

Int. Cl.[2] H04K *1/04*

U.S. Cl. 179—1.5 R 12 Claims



1. In a speech privacy transmission system, means for analyzing speech currents into component frequency band currents in a plurality of separate circuits, a corresponding plurality of separate transmission channels, a common keying circuit having an input side and an output side for keying each of said frequency band currents in succession, distributor means for connecting the input side of said keying circuit to each of said plurality of separate circuits in rotation to enable the frequency band currents therein to be keyed in succession, and distributor means for connecting the output side of said keying circuit to each of said plurality of transmission circuits in rotation to enable the keyed currents to be individually transmitted over said respective channels.

3,979,559

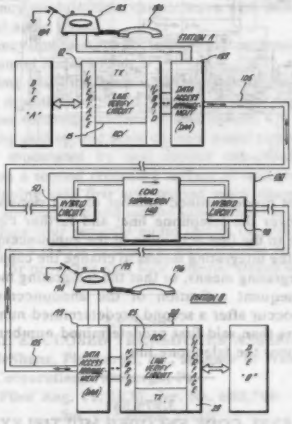
DATA MODEM HAVING LINE VERIFICATION AND AUTOMATIC DISCONNECT FEATURES

Charles William Roedel, Miami Shores, Fla.; Richard Boryslewicz, Smithtown, N.Y.; Richard Tan So, and Larry Wayne Swan, both of Miami, Fla., assignors to Milgo Electronics Corporation, Miami, Fla.

Continuation-in-part of Ser. No. 438,386, Jan. 31, 1974, Pat. No. 3,927,265. This application Sept. 2, 1975, Ser. No. 609,596

Int. Cl.[2] H04M *11/06*

U.S. Cl. 179—2 DP 14 Claims



1. Line verification circuitry for first and second data sets adapted for connection together through a telephone line which includes echo suppressors that are capable of being disabled by a first unique signal so that data provided by data terminal equipment can be transmitted between said first and second data sets after said data sets assume a data set ready condition, said verification circuitry comprising:

means at said first data set for emitting said first unique signal;

means at said second data set, responsive to receipt of said first signal for emitting a second unique signal;

means at said second data set including a first delay means for delivering a data set ready signal a predetermined period of time after emission of said second unique signal; and

means at said first data set, responsive to receipt of said second unique signal from said second data set for delivering a data set ready signal.

3,979,560

TELEPHONE ANSWERING SYSTEM WITH RING DETECTOR

James R. Darwood, Cerritos, Calif., assignor to T.A.D. Avanti, Inc., Paramount, Calif.

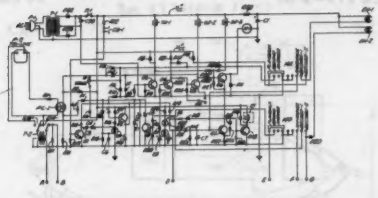
Continuation-in-part of Ser. No. 482,452, June 24, 1974, abandoned. This application Mar. 10, 1975, Ser. No. 556,649

Int. Cl.[2] H04M *11/10*

U.S. Cl. 179—6 R 3 Claims

1. In a telephone answering system which includes, input circuit means to be coupled to a telephone line to respond to telephone messages received over the telephone line, a message magnetic tape recording means, and control circuit means responsive to a predetermined voltage level to activate the announcement magnetic tape storage means and cause a recorded announcement to be transmitted to a calling party during a first time interval (T-1), and for switching the system into a message receiving mode at the end of the first time

interval to permit a message from the calling party to be recorded on the message recording tape, the combination of: ring-detecting means coupled to said input circuit means and responsive to ring signals received over the telephone line to produce a voltage pulse in response to each such ring signal; resistance-capacitive integrating means coupled to the ring-detecting means for integrating the voltage pulses produced thereby until the predetermined voltage level is reached so as to cause the announcement storage means to be activated

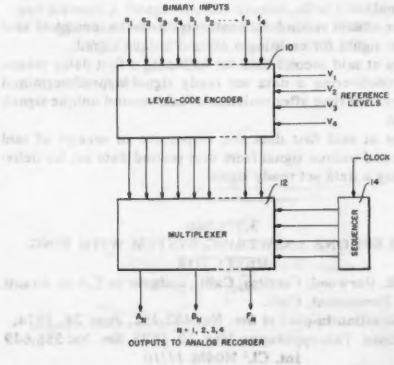


after a first predetermined number of ring signals have been received over the telephone line; and further circuit means responsive to the first activation of the announcement storage means by the integrating means to change the capacitive value of the integrating means, so that the integrating means cuases each subsequent activation of the announcement storage means to occur after a second predetermined number of ring signals, less than said first predetermined number have been received over the telephone line.

3,979,561
LEVEL-CODE ENCODED MULTIPLEXER

Francis E. Hinkle, and David F. Rohde, both of Austin, Tex., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 6, 1975, Ser. No. 574,998
Int. Cl.² H04J 7/00
U.S. Cl. 179—15 A **2 Claims**



1. A system for multiplexing a plurality of digital signals from separate sources onto a few analog channels comprising:

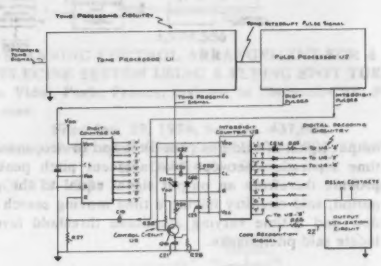
means for encoding digital signals from different sources so as to associate signals from each source with a respectively unique analog reference level representing digital "one" and to associate signals from all sources with a common zero ground level for a digital "zero;" and

sequencing means for multiplexing said signals to their respective channels.

3,979,562
DECODER

Dale E. Rice, 15734 Parthenia St., Sepulveda, Calif. 91343

Filed Nov. 29, 1974, Ser. No. 528,421
Int. Cl.² H04M 1/50
U.S. Cl. 179—84 VF **20 Claims**



1. Detection apparatus for indicating when a semiconductor digital counter has been advanced to a count at which a then energized one of its output conductors is connected to a current accepting source of bilevel voltage, said apparatus comprising:

a semi-conductor digital counter capable of being sequentially advanced through a plurality of counts, said digital counter having a plurality of output conductors which are selectively energized in a configuration representing the then attained count of said counter, each of said conductors having a bilevel voltage thereon which is at a first level when said output conductor is energized, said digital counter drawing substantial current from its main operating voltage supply only when such current is withdrawn from said counter through one of its said output conductors;

means for connecting each of said plurality of output conductors of said digital counter to a corresponding source of bilevel voltage, each said source of bilevel voltage being capable of withdrawing substantial current from an energized output conductor of said digital counter when the output voltage of said source is at the second of said bilevel voltages;

supply voltage means for supplying to the digital counter its main operating supply voltage;

detection circuit means coupled to said supply voltage means, said detection circuit means including a switching circuit means, said further including apparatus responsive to substantial current flow from said supply voltage means to said digital counter for changing the state of said switching circuit means; and

count means for incrementally advancing said digital counter to sequentially energize selected conductors of its output conductors in a configuration representing the attained count of said counter,

whereby the changed state of said switching circuit means indicates that said counter has been advanced to a count at which a then energized one of its output conductors is connected to a current accepting source of bilevel voltage.

3,979,563

COMMUNICATION SYSTEMS OF KEY TELEPHONE SYSTEMS

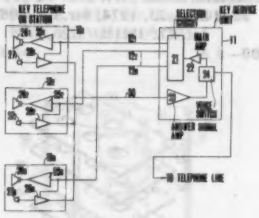
Gunzo Kita, and Kouichi Ohyama, both of Tokyo, Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Mar. 13, 1975, Ser. No. 557,909

Claims priority, application Japan, Mar. 19, 1974, 49-30639

Int. Cl.² H04M 1/60

U.S. Cl. 179—99 8 Claims



1. A communication system for a key telephone system wherein a key telephone is selected by a key service unit and electric power is supplied through a signal line for performing an independent call, the key service unit comprising a voice switch adapted to switch between transmission and reception of speech, each key telephone comprising a loudspeaker, a loudspeaker amplifier and answer signal sending means comprising a microphone and a microphone amplifier, the answer signal sending means being rendered operative by the power supplied from said signal line, a single common answer signal line commonly connected to the outputs of respective answer signal sending means so that when a particular key telephone is called the voice switch operates to switch between the transmission and reception of the speech in response to a call signal and an answer signal permitting the selected key telephone to perform a hand-free communication, a selection circuit disposed between the voice switch and the loudspeaker amplifier, said microphone amplifier being disposed between the microphone and the voice switch, the selection circuit enabling one signal line to select the key telephone, start the loudspeaker amplifier and start the microphone amplifier.

3,979,564

4-CHANNEL STEREO RECORDING AND REPRODUCING METHOD

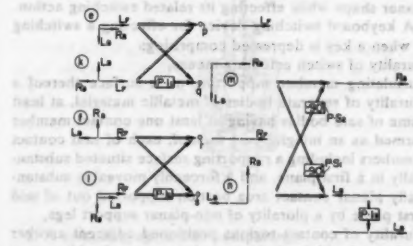
Mayumi Cho, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 8, 1973, Ser. No. 339,466

Claims priority, application Japan, Mar. 9, 1972, 47-24514

Int. Cl.² G11B 3/74; H04N 5/00; H03G 3/24

U.S. Cl. 179—100.4 ST 8 Claims



1. A method of recording and reproducing a four channel stereo signal on a record comprising:

a. generating four related audio signals;

b. matrixing said four audio signals to produce a first main channel audio signal composed of at least three of said four related audio signals in a first predetermined phase and amplitude relationship, a first sub-channel audio signal composed of at least two of said four related audio signals in a second predetermined phase and amplitude relationship, a second main channel audio signal composed of at least three of said four related audio signals in a third predetermined phase and amplitude relationship, and a second sub-channel audio signal composed of at least two of said four related audio signals in a fourth predetermined phase and amplitude relationship,

c. frequency modulating a carrier wave with said first sub-channel audio signal;

d. frequency modulating a carrier wave with said second sub-channel audio signal;

e. recording said first main channel audio signal and said carrier modulated by said first sub-channel audio signal on a first recording surface of said record;

f. recording said second main channel audio signal and said carrier modulated by said second sub-channel audio signal on a second recording surface of said record;

g. reproducing said first and second main channel audio signals and said first and second sub-channel audio signals to produce four separate audio signals capable of being applied to a matrix or discrete stereophonic reproducing system for providing said four channel stereo signal.

3,979,565

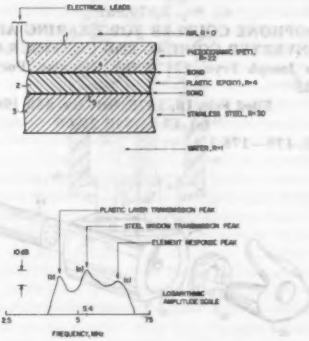
METAL ENCLOSED TRANSDUCER ASSEMBLY

James L. McShane, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 11, 1975, Ser. No. 603,708

Int. Cl.² H04R 17/10

U.S. Cl. 179—110 A 22 Claims



1. A transducer for the transmission of acoustic energy substantially at given frequency through a transmitting medium, comprising:

a piezoelectric member having a front and a back face;

a metallic capsule having a front window interposed between said transmitting medium and said front face; and

a plastic material interposed between said piezoelectric member and said capsule and forming a plastic layer between said front face and said window; wherein said piezoelectric member, said plastic layer and said capsule window have thicknesses which are substantially equal to the half wavelength of the acoustic wave at said frequency therethrough, each of said thicknesses defining a corresponding peak frequency, wherein each peak frequency is slightly different from the two others, the central frequency being the one of said front window,

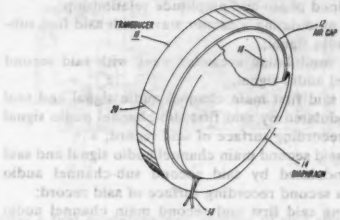
whereby a broadened frequency response characteristic is otained about said given frequency.

3,979,566

ELECTROMAGNETIC TRANSDUCER

Erazm Alfred Willy, 1254 Rte. 104, Apt. 1C, Ontario, N.Y. 14519

Filed Dec. 12, 1973, Ser. No. 424,001
Int. Cl.² H04R 7/18
U.S. Cl. 179—115.5 ES **41 Claims**



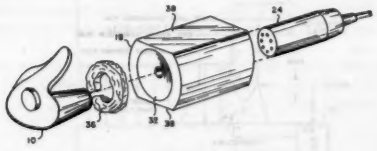
1. An electroacoustic transducer comprising:
a diaphragm;
tubular shaped current conduction means secured to said diaphragm along a peripheral edge thereof;
concentric tubular shaped open ended magnetic flux translative elements providing at least one tubular shaped air gap therebetween for receiving said current conduction means, and
permanent magnet means mounted between said elements so that said elements concentric magnetic flux from said permanent magnet means through said air gap.

3,979,567

MICROPHONE COUPLER FOR HEARING AID HAVING INVERTED CONICAL END CONFIGURATION

George Joseph Frye, 12175 SW. Douglas, Portland, Oreg. 97225

Filed Feb. 18, 1975, Ser. No. 550,196
Int. Cl.² H04R 29/00
U.S. Cl. 179—175.1 A **5 Claims**



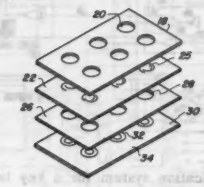
1. A microphone coupler for coupling a microphone and an ear mold of variable shape of hearing aid to test the operational characteristics of the hearing aid, said ear mold having a transmitting end, comprising:
a body member having a cavity means of predetermined volume therein and a bore extending from one end of said body member to said cavity means and being in communication therewith, said bore adapted to receive the microphone therein;
means for retaining the microphone in predetermined position in said bore;
surface means in the other end of said body member having an inverted conical configuration and having an aperture no greater than the outside diameter of the transmitting end of the ear mold for receiving thereagainst a transmitting end of the ear mold, said other end having a hole therein providing communication between the transmitting end of the ear mold and said cavity means; and
means for acoustically sealingly maintaining the transmitting end of the ear mold against said surface means.

3,979,568

KEYBOARD SWITCH ASSEMBLY HAVING RAISED CONTACTS SUPPORTED BY HELICLINE LEGS ON A COMMON CONDUCTIVE SHEET

Wendell C. Johnson, Topanga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 23, 1974, Ser. No. 508,482
Int. Cl.² H01H 13/26, 1/06
U.S. Cl. 200—5 A **39 Claims**



34. A keyboard switching device for effecting a switching action when a key is depressed comprising:
a plurality of switch actuating means,
a metallic member having a plurality of switching members formed as integral parts thereof, at least some of said plurality of switching members including a forceable movable, substantially planar contact area portion supported above a substantially planar supporting surface portion by a plurality of non-planar support legs,
a plurality of contact regions positioned adjacent said metallic member, at least some of said contact regions having at least a portion thereof in operative alignment with different ones of said switch actuating means and with different ones of said contact area portions, and
means for normally separating said metallic number from said plurality of contact regions but permitting each of said aligned contact area portions to be forced toward its aligned contact region when a force is applied to its aligned switch actuating means to thereby effect a switching action,
each of said contact area portions retaining its substantially planar shape while effecting its related switching action.

36. A keyboard switching device for effecting a switching action when a key is depressed comprising:
a plurality of switch actuating means,
an insulating member supporting on a surface thereof a plurality of separate bodies of metallic material, at least some of said bodies having at least one contact member formed as an integral part thereof, each of said contact members including a supporting surface situated substantially in a first plane, and a forceably moveable substantially planar contact area portion supported out of said first plane by a plurality of non-planar support legs,
a plurality of contact regions positioned adjacent another surface of said insulating member, some of said contact regions having at least a portion in operative alignment with different ones of said switch actuating means and with different ones of said contact area portions,

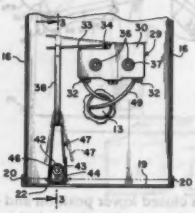
said insulating means having a plurality of apertures therein for permitting each of said contact area portions to be forced toward its aligned contact region when a force is applied to its aligned switch actuating means to thereby effect a switching action.

3,979,569

WATER LEVEL SENSING DEVICE HAVING RUPTURABLE HYGROSCOPIC-TYPE SWITCH ACTUATOR

Michael Bilgrei, 111-20 73rd Ave., Forest Hills, N.Y. 11375

Filed July 28, 1975, Ser. No. 599,479
Int. Cl.² H01H *35/18*
U.S. Cl. 200—61.04 **6 Claims**



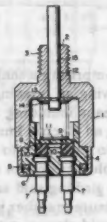
1. A water level sensing device comprising a housing having a bottom opening therein, a microswitch disposed in said housing and including a horizontally extending actuating arm swingable between advanced depressed and raised retracted positions and resiliently urged to its retracted position, a loop formed of a material having relatively low wet and relatively high dry strengths, and means for supporting said loop in said housing in a vertically extending position between said actuating arm and an underlying point to retain said arm in its advanced position, the stress of said actuating arm being imparted to said loop and exceeding the wet strength and being less than the dry strength of said loop whereby to rupture said loop when wet, and effect the switch actuating retraction of said actuating arm only with the rupture of said loop.

3,979,570

SWITCHING APPARATUS

Masayoshi Hyodo, Toyota, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Japan

Filed May 14, 1974, Ser. No. 469,712
Claims priority, application Japan, May 16, 1973, 48-58022[U]; May 16, 1973, 48-58023[U]
Int. Cl.² H01H *35/38*
U.S. Cl. 200—264 **4 Claims**



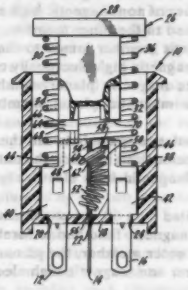
1. A switching apparatus comprising:
a switch casing,
a plurality of terminals connected to an electric circuit,
a holder of electrical insulating material fixedly supporting at least one of said terminals,
at least one contact element of conductive elastomeric material disposed to be engageable with said terminals,
a movable member for imparting a compressing force to said contact element,
and actuating means disposed in said switch casing for actuating said movable member,
said holder being firmly secured to said switch casing,
said actuating means comprising a fluid-operated actuator including a fluid passage and a fluid reserving space formed in said switch casing for communication with a source of fluid pressure,
said contact element being normally compressed by the force of a spring so that said contact element is electrically conductive when said fluid-operated actuator is not in operation,
and said diaphragm acting to release said contact elememt from the compressed state through a slider against the force of said spring when said fluid operated actuator is placed in operation.

3,979,571

BUCKLED SPRING SWITCH MECHANISM WITH LATCHING PUSHBUTTON

Peter J. Van Benschoten, Rancho Santa Fe, Calif., assignor to Oak Industries Inc., Crystal Lake, Ill.

Filed Dec. 9, 1974, Ser. No. 531,038
Int. Cl.² H01H *1/20*
U.S. Cl. 200—328 **8 Claims**

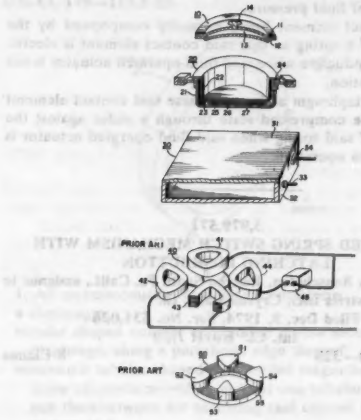


1. In a switching mechanism, a housing, at least two terminals partly positioned within said housing, an actuator mounted for reciprocal movement within said housing, return spring means positioned within said housing and normally biasing said actuator outwardly of said housing,
coil spring means pivotally mounted under endwise buckling pressure between spaced portions of one of said terminals, a slider positioned in one end of said coil spring means and bearing against one of said spaced terminal portions, said slider being positioned for mechanical contact by said actuator for pivotally moving said coil spring means, about said spaced terminal portions, into and out of electrical contact with the other terminal, cooperating means on said slider and actuator for latching said actuator in an inward position when said actuator has caused said coil spring means to be in electrical contact with said other therminal.

3,979,572
INDUCTION HEATING APPARATUS

Toshio Ito; Masahiro Hibino, and Tetsuya Kohya, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1974, Ser. No. 518,731
Int. Cl.² H05B *5/04*
U.S. Cl. 219—10.49 **18 Claims**



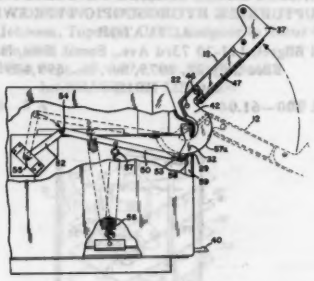
1. Induction heating apparatus comprising:
an inner member for holding material to be heated,
an outer member of non-magnetic high electrically resistive material joined to the inner member,
a planar magnetic member joined to the inner member,
a planar non-magnetic high electrically conductive member joined to the magnetic planar member to be disposed between the magnetic planar member and the outer member,
a thermally insulative space between the outer member and the inner member and between the outer member and the planar non-magnetic high electrically conductive member,
an exciter excited by a 60 cps power source to generate an alternating magnetic field and to form a magnetic circuit through the outer member, the planar magnetic member and the planar non-magnetic high electrically conductive member,
the outer member being of stainless steel with a diameter of 15–25 cm. and a thickness of 0.3–0.5 mm.,
the inner member being of stainless steel with a thickness of 0.4–0.7 mm.,
the planar magnetic member being an iron plate with a thickness greater than 2.6 mm.,
the planar non-magnetic high electrically conductive member being aluminum with a thickness of 0.3–2.7 mm.

3,979,573
MICROWAVE OVEN DOOR HINGE

Richard H. Burns, and William J. Walthour, both of Troy, Ohio, assignors to Hobart Corporation, Troy, Ohio

Filed Feb. 14, 1975, Ser. No. 549,965
Int. Cl.² H05B *9/06*
U.S. Cl. 219—10.55 D **7 Claims**

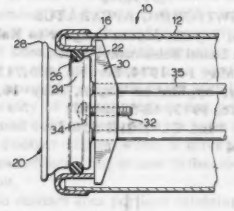
1. In a microwave oven which includes a cabinet defined by side, top, bottom, rear walls, and a front wall with a substantially vertically arranged aperture therein defining a plane, said walls defining a heating cavity accessible through said aperture, and a source of microwave energy coupled to the interior of said cavity, the improvement comprising:
a cavity closing door movable in an arcuate path about an axis adjacent to the upper portion of said door between a closed lower position covering said aperture and an open upper position above said aperture,
pivotal supporting means pivotally mounted behind said front wall at a point which is above said door when said door is in its closed lower position and including connecting arm means extending through the plane of said front wall and rigidly attached to said door, and
a rearwardly recessed surface above said aperture to permit the arcuate path of said door between said closed lower position and said open upper position substantially to exceed 90°.



3,979,574
TANK TYPE ENGINE HEATER

Richard Haig John Rynard, Toronto, Canada, assignor to Canadian General Electric Company Limited, Toronto, Canada

Filed Mar. 31, 1975, Ser. No. 563,711
Int. Cl.² H05B *3/82*; F02N *17/06*; F24H *1/10*
U.S. Cl. 219—208 **4 Claims**



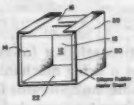
1. In a tank heater comprising a shell having liquid inlet and outlet conduits and having an opening therein adapted to be closed by a closure means including a closure member, said closure member having an electric immersion heating element dependent therefrom to project into said shell, said closure member comprising a plug having an annular wall portion, an O ring sealing member girdling said annular wall portion, and means to retain said closure member in its closed position, the improvement wherein said closure means includes an annulus having a U-shaped wall, the outer leg thereof being circumferentially connected in sealed relation to said opening, the inner leg thereof extending inwardly of said opening and being spaced from the inner surface of said shell, said O ring sealing member engaging said inner leg when said closure member is inserted into said annulus.

3,979,575

PORTABLE ELECTRIC OVEN

Werner H. Maahs, Milwaukee, Wis., assignor to M & M Enterprises, Inc., Milwaukee, Wis.

Filed May 29, 1975, Ser. No. 581,786
Int. Cl.[2] F27D *11/02*
U.S. Cl. 219—407 2 Claims



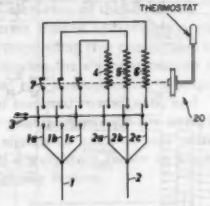
1. An electric oven comprising: a plurality of external wall members; a plurality of internal wall members forming an internal oven compartment; a door closing said oven compartment; a sheet of insulating material formed of silicone rubber wrapped around the internal wall members having a width corresponding substantially to the width of the wall members of the internal wall members and extending as a single layer substantially around the internal wall members forming the oven compartment between the internal and external wall members; and bare electrical resistance wires embedded in the silicone rubber sheet and around said internal wall members and having electrical leads for connection to an electrical energizing source for heating the oven compartment.

3,979,576

ELECTRIC HEATING ELEMENT CONTROL CIRCUIT

Sven-Olof Janson, Svarvaregatan 6, Halmstad, Sweden (30250)

Filed May 28, 1974, Ser. No. 474,077
Claims priority, application Sweden, June 14, 1973, 7308360
Int. Cl.[2] H05B *1/02*
U.S. Cl. 219—489 2 Claims



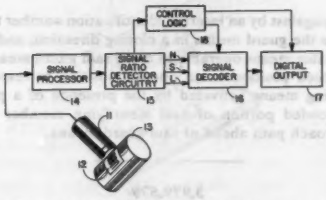
1. An electric heating circuit for connecting an electric heating apparatus, to a source of power comprising a plurality of heating elements, an alternating current electric network having at least one phase, each phase of the network being evenly divided into a number of part leads, the total number of part leads being twice the number of heating elements; said part leads being arranged into two series of part leads each comprising as many part leads as the number of heating elements in the apparatus; a first switch means being arranged simultaneously to close and open all part leads of both of said series; each separate part lead of a first one of said series being connected to one separate terminal pole of a respective one of the said heating elements; a second multipolar switch being disposed in said first series of part leads, said second switch being controlled by a thermostat and adapted to open at least one of the separate part leads of the said first series, thereby disconnecting at least one associated heating element in response to impulses from the thermostat; each separate part lead of the second series of part leads being directly connected to the corresponding other terminal pole of a respective one of the heating elements.

3,979,577

CODE RECOGNITION RECORD MEDIUM AND TECHNIQUE

Lawrence Seligman, Sherborn, Mass., assignor to Data General Corporation, Southboro, Mass.

Filed Dec. 5, 1973, Ser. No. 421,884
Int. Cl.[2] G02B *5/14*; G06K *7/10*
U.S. Cl. 235—61.12 N 7 Claims



1. In a record medium for storing at least one of a plurality of characters scannable in a reading direction, each character formed by a maximum of seven abutting equal sized modules of information where each module is coded to have one or the other of the values of a two-level code consisting of at least six consecutive transitional occurrences between the two levels where not more than two modules of the same level are arranged consecutively, the improvement comprising:

each character arranged in a configuration so that two consecutive ones of said modules of a first level are not immediately followed by the two consecutive ones of said modules of the second level,

alternate ones of said transitional occurrences defining four distances where the ratios of overlapping ones of said distances represent not more than one of three preselected values enabling each character to be uniquely identified, and

each of said plurality of characters being formed by said maximum of seven abutting equal sized modules in a manner to permit no more than four changes of said code values within each of said plurality of characters.

3,979,578

ACCESS CONTROLLER AND SYSTEM

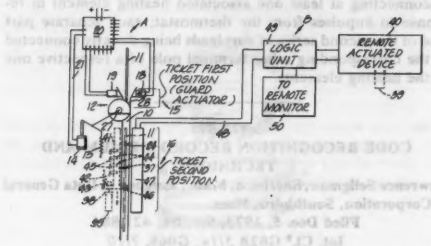
Ira J. McCullough, 5820 S. Alameda St., Los Angeles, Calif. 90024; Albert J. Lee, 7419 Ruffner St., Van Nuys, Calif. 91406, and John G. Sullivan, 1034 - 17th St. Apt. 102, Santa Monica, Calif. 90403

Filed June 23, 1975, Ser. No. 589,244
Int. Cl.[2] G06K *7/04*, *19/06*
U.S. Cl. 235—61.11 E 12 Claims

1. In a controller having an opening for receiving a key-coded identification member such as a ticket, card, and the like, means for guarding said opening against the reception of foreign objects which might jam the opening and prevent reception of an identification member, the improvement comprising:

a. guard means in an approach path of movement, of the identification member, passing through said opening, said guard means being rotatably supported for movement to opened and closed positions with respect to said opening, and being normally motivated towards said closed position, said guard means in said closed position presenting an abutment surface such that pressure forces applied thereagainst by an inserted identification number tends to force the guard means in a closing direction; and

b. actuator means operable to move said guard means from a closed position to an opened position in response to sensing means activated by the presence of a properly key-coded portion of said identifying member in said approach path ahead of said guard means.

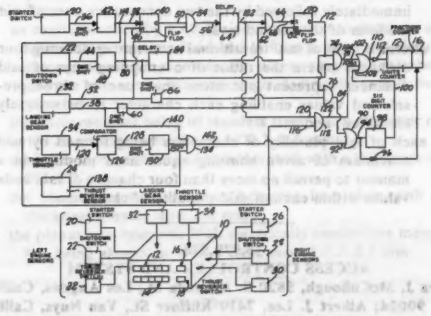


3,979,579

AIRCRAFT ENGINE FATIGUE CYCLE RECORDER

Joseph Kleinpeter, Center Moriches, N.Y., assignor to Lawrence Peska Associates, Inc., N.Y., a part interest

Filed May 19, 1975, Ser. No. 579,037
Int. Cl.[2] G06G 7/78
U.S. Cl. 235—150.2 3 Claims



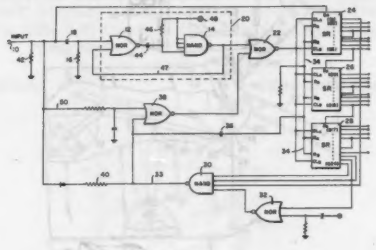
3. In a multi-engine aircraft, counter means for individually displaying stress cycles undergone by each engine, means for individually sensing the starting, shutdown, and thrust reversal of each engine, means for sensing the status of the aircraft landing gear, means for sensing the throttle setting for the engines and logic means responsive to said various sensing means for deriving a count of stress cycles individually for each engine and means responsive to said deriving means for individually indexing said counter means.

3,979,580

FUNCTION SELECTOR

Thomas W. Crilly, Silver Spring, and Michael C. Gariazzo, Bowie, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 15, 1975, Ser. No. 568,236
Int. Cl.[2] G06G 7/26; F42B 5/08
U.S. Cl. 235—150.53 7 Claims



1. A function selector for receiving coded information for programming a firing mechanism comprising:

a monostable multivibrator for receiving an input signal and supplying output signals;

an inverter coupled to the output of said multivibrator for receiving said output signals;

shift register means coupled to the output of said inverter for receiving output signals from said inverter, said shift register further coupled directly to said input signal; and

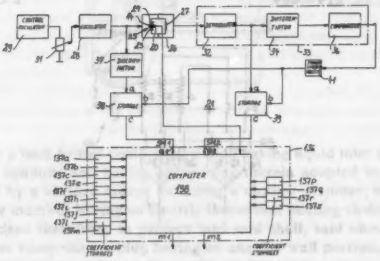
logic means coupled to said shift register means for detecting an incorrect code in said shift register means to reset said shift register means.

3,979,581

METHOD AND ARRANGEMENT FOR DETERMINING THE MASS OF TOBACCO OR THE LIKE A MATERIAL BY CAPACITANCE AND ATTENUATION MEASUREMENTS IN A RESONANT HIGH FREQUENCY OSCILLATOR CIRCUIT

Joachim Reuland, Hamburg, Germany, assignor to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Filed Feb. 24, 1975, Ser. No. 552,047
Claims priority, application Germany, Feb. 26, 1974, 2409102
Int. Cl.[2] G01R 27/26; G06F 15/20
U.S. Cl. 235—151.33 33 Claims



20. Apparatus for determining the mass of a material which constitutes at least a part of the dielectric of a capacitor in a high-frequency oscillator circuit, comprising first measuring means coupled to said oscillator circuit and arranged to furnish a capacitance signal corresponding to the capacitance of said capacitor; second measuring means coupled to said oscillator circuit and arranged to furnish an attenuation signal

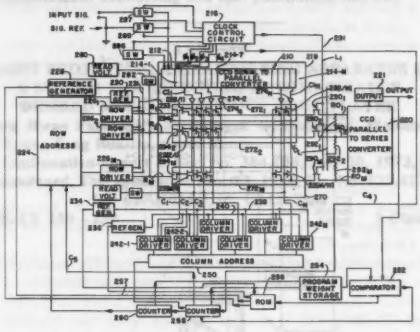
corresponding to the attenuation of said oscillator circuit; and computing means for providing a third signal which is indicative of the mass of said material, said computing means being connected to said first and second measuring means and including storage means for storing a plurality of constants, said third signal being a function of said capacitance signal, said attenuation signal and said constants.

3,979,582

DISCRETE ANALOG PROCESSING SYSTEM INCLUDING A MATRIX OF MEMORY ELEMENTS

James H. Mims, Linthicum Heights, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 17, 1974, Ser. No. 506,906
Int. Cl.² G11C *11/40*; H03K *5/159*
U.S. Cl. 235—193 **24 Claims**



1. A discrete analog signal processing system for processing an input signal in accordance with a pattern of weighting factors, said system comprising:

a. a matrix of memory elements disposed in rows and columns, each of said memory elements capable of storing an analog weighting factor of the pattern and responsive to a portion of the input signal applied thereto for providing an element output indicative of the product of the stored weighting factor and the input signal portion, said matrix further comprising first sets of row and column conductors coupled to the corresponding memory elements of said matrix;

b. first converter means comprising a plurality of stages coupled to corresponding column conductors and responsive to the input signal for disposing sequentially a portion of the input signal at each of its stages, whereby a signal portion is applied through its corresponding column conductor to those memory elements of that column;

c. second converter means comprising a plurality of stages coupled to corresponding row conductors of said matrix, for summing and storing the element outputs of those memory elements of that row and operative to sequentially read out the plurality of summed row signals; and

d. programming generator means for applying conductance programming signals to each of said memory devices for storing therein a weighting factor in accordance with the pattern of weighting factors.

3,979,583

PHOTOFLASH FILTER

John J. McCan, Belmont, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

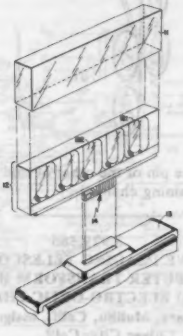
Filed July 26, 1974, Ser. No. 492,055
Int. Cl.² G03B *15/02*
U.S. Cl. 240—1.3 **4 Claims**

1. Illumination apparatus for use in photography comprising:

a photoflash lamp which emits radiant energy having a distribution of wavelengths ranging from less than 400 nm to greater than 700 nm;

a filter element associated with said photoflash lamp for filtering out the photographically superfluous radiation emitted by said photoflash lamp, said filter element comprising at least one material providing a maximum absorption of infrared radiation of wavelengths greater than 700 nm while providing maximum transmission of radiation in the visible region of the spectrum;

said filter element being fabricated from an organic plastomeric material which is substantially transparent to radiation in said visible region, said filter element including either (a) the combination of 1,4,5,8-tetrakismethylamino-anthraquinone together with 1,4-bis(sec-buty)



amino-anthraquinone or (b) the combination of 1,4,5,8-tetrakismethylamino-anthraquinone together with a dithio-metal complex of the formula:

wherein Me is Ni or Pt; and all R's represent the same substituted or unsubstituted phenyl group;

said filter element absorbing at least 10% of the total radiation having wavelengths between 700 nm and 2,000 nm.

3,979,584

MODULAR CHANDELIER

George Fossati, 337 E. Palisades Blvd., Palisades, N.J. 07650

Filed Jan. 22, 1975, Ser. No. 543,152
Int. Cl.² F21S *1/06*, *3/06*
U.S. Cl. 240—78 F **9 Claims**

7. In a chandelier,

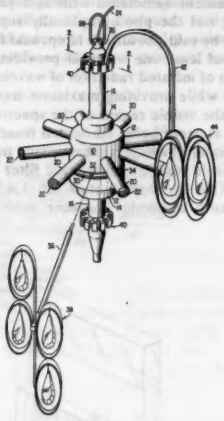
a support arm having two pairs of faces;

a first pair of pins extending outwardly from one of the pairs of faces of said support arm and occupying a first plane along the axis of said support arm;

a second pair of pins extending outwardly from the other of the pairs of faces of said support arm and occupying a second plane along the axis of said support arm; and

a connector ring having on its periphery at least one opening including three separate channels angularly spaced from one another by ninety degrees, the opposing pair of

channels being sloped inwardly toward the center of said ring to receive one of said pairs of pins in locking relationship while one pin of the other of said pairs of pins occupies the remaining channel.



3,979,585

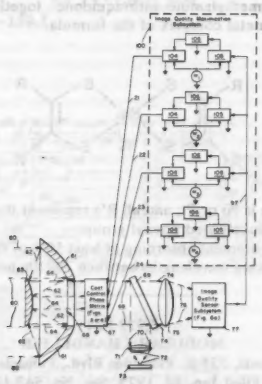
ADAPTIVE IMAGING TELESCOPE WITH CAMERA-COMPUTER TRANSFORM IMAGE QUALITY SENSING AND ELECTRO-OPTIC PHASE SHIFTING

Thomas R. O'Meara, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed June 24, 1974, Ser. No. 482,175

Int. Cl.² G01J *1/20*

U.S. Cl. 250—201 **7 Claims**



1. In an adaptive imaging telescope for detecting an optical image received by the telescope, comprising in combination:

an electro-optic phase shifter, including a planar crystal having two major surfaces and a plurality of electrodes attached to the major surfaces, which phase shifter is positioned substantially at the optical image plane of the telescope aperture, responsive to the optical image;

first means optically coupled to the phase shifter, comprising a video camera responsive to light from the optical image, an analog to digital converter electrically connected to the output of the video camera, a transform processor connected to the output of the converter, and digital computation means electrically connected to the output of the processor; and

second means, electrically coupling the first means and phase shifter, for providing phase modulation of the optical image.

3,979,586

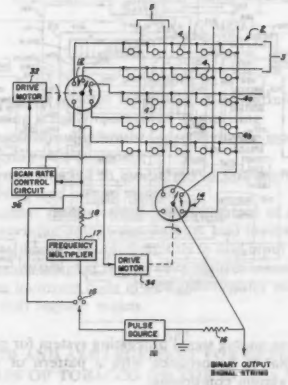
NON-CRYSTALLINE DEVICE MEMORY ARRAY

David D. Thornburg, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 9, 1974, Ser. No. 530,897

Int. Cl.² H01J *39/12*

U.S. Cl. 250—209 **5 Claims**



1. A memory array comprising a matrix of non-crystalline, semiconductor threshold switching devices each having a V-I characteristic comprised of a high resistance state region and an abrupt transition to a low resistance state region and including means to heat at least a portion of said array,

first means for switching at least one of said threshold switching devices to its low resistance state,

second means for sampling each of said threshold switching devices of said matrix with voltage pulses having a magnitude and repetition rate sufficient to maintain said switched threshold switching device in its low resistance state without switching any other of said threshold switching devices to its low resistance state, and

third means for interrupting said voltage pulses from said second means to allow said switched threshold switching device to revert to its high resistance state.

3,979,587

COMPONENT FOR LIGHT DETECTION AND EMISSION

Baudoin de Cremoux, Paris, France, assignor to Thomson-CSF, Paris, France

Filed May 27, 1975, Ser. No. 580,756

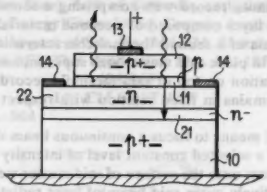
Claims priority, application France, May 28, 1974, 74.18461

Int. Cl.² H01J *39/12*

U.S. Cl. 250—211 J **12 Claims**

1. A solid-state light emitter and receiver component comprising superimposed upon one and the same substrate an electroluminescent diode and a photodiode, said electroluminescent diode and said photodiode operating respectively in a

first and in a second light frequency band, said electroluminescent diode being transparent vis-a-vis said second light frequency band, and means for alternately rendering said electroluminescent conducting and said photodiode blocked.



3,979,588

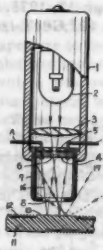
LIGHT PROJECTING AND ABSORBING APPARATUS IN A SYSTEM FOR SELECTING AUTOMATICALLY DESIRED MUSIC IN PHONOGRAPHIC PLAYER

Jang Hwan Park, 537, Naechungri, Oedongmyon, Wolsung, Kyung Sang Buk-Do, South Korea

Continuation-in-part of Ser. No. 384,108, July 30, 1973, abandoned. This application Nov. 13, 1974, Ser. No. 523,422

Int. Cl.[2] H01J 5/16; G11B 7/06

U.S. Cl. 250—239 **1 Claim**



1. A detecting unit for an automatic tune selection system of a phonographic record player comprising a light projector adapted to project light rays from a light source onto a portion of a face of a record disc and a CdS photoelectric element adapted to be impinged upon by the reflections of said light rays, a cylindrical casing housing said light projector and said photoelectric element, a light barrel shield fixed to the lower end portion of said casing and extending downwardly therefrom and having a constricted aperture formed on the lower end thereof, said photoelectric element being secured in said casing downwardly from said light source and upwardly from said constricted aperture, a light shield disc disposed on top of and in abutting relationship with said photoelectric element, said photoelectric element and light shield disc having a passage bore formed through the centers thereof providing a passage for said light rays of said light source which are projected therethrough, said constricted aperture forming a passage for both outgoing light rays of said light source and incoming reflections of said light rays reflected from a portion of the face of said record disc, the constricted aperture having a diameter which is substantially smaller than the diameter of said photoelectric element and also smaller than the inner diameter of said casing as well as the diameter of said light shield barrel, thereby forming a limited passage for the exclusive reception of sharp angled reflections of said light rays of said light source.

3,979,589

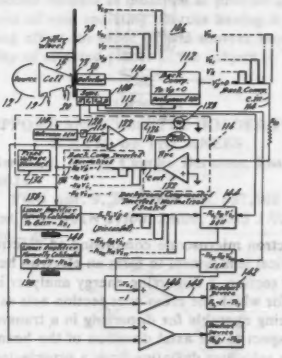
METHOD AND SYSTEM FOR THE INFRARED ANALYSIS OF GASES

Stanley R. Sternberg, Ypsilanti; James E. Young, Detroit, and John W. Lennington, Ypsilanti, all of Mich., assignors to Finn Bergishagen; John S. Abbott; Kenneth A. Hutchinson; James E. Young; John W. Lennington and Stanley R. Sternberg, all of Union Lake, Mich.

Division of Ser. No. 420,305, Nov. 29, 1973, Pat. No. 3,887,473, which is a division of Ser. No. 281,958, Aug. 18, 1972, Pat. No. 3,790,798, which is a continuation-in-part of Ser. No. 178,260, Sept. 7, 1971, Pat. No. 3,790,797, which is a continuation-in-part of Ser. No. 809,752, March 24, 1969, abandoned. This application Mar. 31, 1975, Ser. No. 563,709

Int. Cl.[2] G01D 18/00

U.S. Cl. 250—252 **28 Claims**



1. A spectrophotometer having chamber means for containing a fluid for analysis, indicating means for indicating the concentration of a component of said fluid, and an adjustable calibration control for setting said indicating means to a zero indication while a substantially nonabsorbing fluid is contained in said chamber comprising:

means providing a component signal which is related to the concentration of said component of said fluid;

means providing a reference signal;

means for providing a component ratio signal representative of the ratio of said component signal with respect to said reference signal including adjustment means receiving said component signal and said reference signal for adjusting said reference signal so that said reference signal represents a predetermined standard value, said adjustment means adjusting said component signal an amount correlative to said adjustment of said reference signal to provide said component ratio signal;

means for reducing said component ratio signal an amount representative of said standard value to provide a reduced component ratio signal; and

means associated with said adjustable calibration control and said indicating means for adjusting said reduced component ratio signal and providing for the indication thereof by said indicating means in a manner so that said indication indicates zero when said substantially nonabsorbing fluid is in said chamber, said adjustable calibration control and said means associated with said adjustable calibration control being adapted to be invariant when said fluid having said component is analyzed so that said indicating means indicates the concentration of said component in said fluid.

3,979,590

ELECTRON MICROSCOPE COMPRISING AN ENERGY ANALYZER

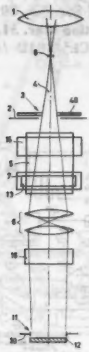
Willem Hendrik Jan Andersen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 28, 1975, Ser. No. 562,965

Claims priority, application Netherlands, Apr. 1, 1974, 7404363

Int. Cl.² H01J 37/26

U.S. Cl. 250—305 **5 Claims**



1. An electron microscope comprising an electron source, electron-optical lens system to form an electron beam having a cross-over section, a dispersing energy analyzer including a Wien filter for which the cross-over section acts as an object, said filter being operable for dispersing in a transverse direction with respect to the axial direction of the beam the electrons having velocities deviating from a preselected velocity; a four-pole lens system located at the output of said filter to increase the dispersion in said transverse direction, deflection means for moving the beam in said transverse direction, an output screen located in an image plane and having an elongate slot extending in said transverse direction, and an electron detector located behind the slot.

3,979,591

METHOD AND APPARATUS FOR TRANSFERRING A PATTERN ON AN OVERLYING WEB BY LASER BURNING INTO AN UNDERLYING WEB

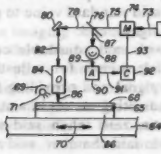
Daniel Silverman, 5969 S. Birmingham St., Tulsa, Okla. 74105

Continuation-in-part of Ser. No. 262,290, June 13, 1972, Pat. No. 3,832,547. This application Aug. 20, 1974, Ser. No. 498,954

The portion of the term of this patent subsequent to Aug. 27, 1991, has been disclaimed.

Int. Cl.² G03C 5/16

U.S. Cl. 250—317 **22 Claims**



1. A system for directly transferring a micropattern of microperforations in a first metal web to an underlying second web, comprising:

a. a master record web comprising a first metal layer carrying a first micropattern of microperforations, said first metal layer composed of a first metal, of a first thickness of a first thermal characteristic;

b. a facsimile record web comprising a second layer, said second layer composed of a second material, of a second thickness of a second thermal characteristic;

c. means to place said master web superimposed in contiguous relation on top of said facsimile record so that each web remains in fixed relation with respect to the other web;

d. optical means to focus a continuous beam of laser radiation of a selected constant level of intensity and to direct said beam onto the surface of said master web, and means to relatively move said beam of laser radiation over substantially the entire area of said micropattern on said master web in a plurality of parallel paths, at a selected velocity; and wherein

e. said first metal has a higher melting point than the melting point of said second material;

whereby said focussed beam will penetrate said microperforations in said first metal layer and irradiate said second layer below, and will burn microperforations in said second layer in a second micropattern which is identical to said first micropattern.

3,979,592

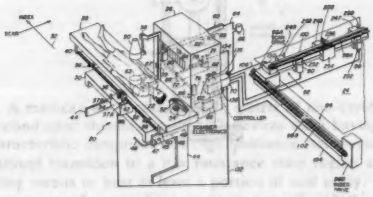
LARGE AREA RADIOGRAPHIC SCANNER

Edward J. Doherty, III, Halifax, and David W. Morrison, Burlington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 373,058, June 25, 1973, abandoned. This application Apr. 17, 1975, Ser. No. 569,024

Int. Cl.² G01T 1/16

U.S. Cl. 250—363 S **5 Claims**



1. A radiographic display system comprising:

a radiation detector assembly;

means for scanning said radiation detector assembly in a prescribed format which includes a scanning along a first axis and a scanning along a second axis normal thereto, said detector scanning means comprising means for sensing the position of said detector;

means for supporting a subject emitting radiation spaced from said radiation detector assembly;

means coupled to said radiation detector assembly for producing an image, said image producing means comprising recording means and means for scanning said recording means;

means coupled between said detector scanning means and said image producing means for signaling said image producing means to scan in a format similar to said format of said detector scanning, said signaling means including means for altering the relative sizes of said detector scanning format and said image scanning format; and

means for positioning said subject support means concurrently with a portion of a scanning of said detector scan format, said support positioning means comprising means for sensing the position of said subject support and means responsive to each of said sensing means for positioning said support.

3,979,593

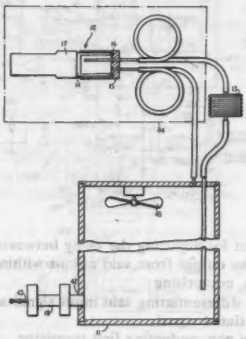
DETECTOR FOR MEASURING A RADIOISOTOPE TRACER GAS

Walter Thomas Spragg, Sutherland, and Brian William Seatonberry, San Souci, both of Australia, assignors to Australian Atomic Energy Commission, Coogee, Australia

Continuation-in-part of Ser. No. 344,034, March 22, 1973, Pat. No. 3,866,057. This application Aug. 19, 1974, Ser. No. 498,869

Int. Cl.² G01T *1/20*

U.S. Cl. 250—364 1 Claim



1. A beta radioactivity detector comprising a hollow body section of radiation opaque material with an aperture therein, a piece of phosphor light-conductive material located in sealing engagement in the aperture to form a gas-tight fixed volume enclosure, a gas inlet and outlet to the enclosure and a photomultiplier tube with a window mounted against the phosphor light-conductive material in the aperture, whereby the beta activity of a gas in the enclosure causes light generation in the phosphor said light being conducted to the photomultiplier tube, said enclosure comprising a light transparent or translucent phosphor cup of plastics material having a base and at least one side wall, said plastics cup being inserted in a substantially gas tight manner within a metal cup to define said enclosure, the base of the plastics cup forming in combination said aperture closure and said phosphor light-conductive material.

3,979,594

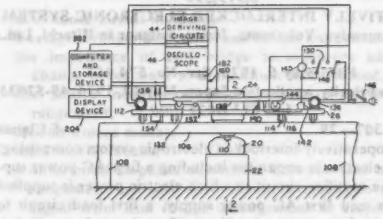
TOMOGRAPHIC GAMMA RAY APPARATUS AND METHOD

Hal O. Anger, 1771 Highland Place, Berkeley, Calif. 94709

Continuation of Ser. No. 794,327, Jan. 27, 1969, which is a continuation-in-part of Ser. No. 646,804, June 15, 1967, abandoned. This application Mar. 23, 1972, Ser. No. 237,521

Int. Cl. G01t *1/16*

U.S. Cl. 250—369 53 Claims



1. An apparatus for obtaining a radiation distribution readout of radiating sources located at different depths in a subject, by a single scan of the subject, said apparatus comprising:

a. a radiation image forming first means for producing images of said sources wherein the relative positions of the images of sources on a plurality of selected different planes within said subject will vary with changes in the relative positions of said first means and said subject during said scan;

b. image detecting second means converting said images, and producing a plurality of first outputs giving information as to the positions of said images;

c. third means for changing the relative positions of said first means and said subject for examining said subject from a plurality of relative positions, said third means including means for providing a plurality of second outputs during said scan having information as to said relative positions; and

d. image deriving fourth means for modifying at least one of said first and second outputs and for combining said first and second outputs as modified to provide a plurality of readouts of said radiating sources having a preferential focusing effect for those of said sources located on said plurality of selected planes in the subject.

3,979,595

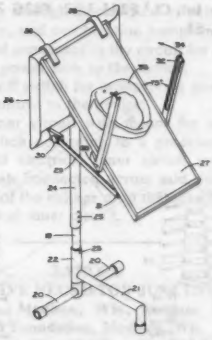
KNEE SUPPORT AND CASSETTE HOLDER FOR AXIAL X-RAYS OF THE KNEES

Alan C. Merchant, 23415 Camino Hermoso, Los Altos Hills, Calif. 94022

Filed Apr. 9, 1975, Ser. No. 557,800

Int. Cl.² G01N *21/00, 23/00;* H01J *37/20*

U.S. Cl. 250—451 5 Claims



1. An x-ray film cassette and leg holder comprising:

A. A knee support frame;

B. A leg support member hingedly secured to said frame for supporting legs over the end of an x-ray table; and

C. An x-ray film cassette holder secured to said leg support member for maintaining a cassette in a plane perpendicular to the central x-ray beam aimed down at an angle toward the knee caps.

3,979,596

CORONAMETRIC INSTRUMENT FOR AEROSOL MEASUREMENTS

Glenn E. Shaw, and Charles S. Deehr, both of Fairbanks, Alaska, assignors to The United States of America as represented by the Administrator of the Environmental Protection Agency, Washington, D.C.

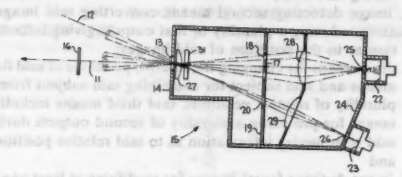
Filed Oct. 24, 1975, Ser. No. 625,790

Int. Cl.² G01N *21/26, 21/06*

U.S. Cl. 250—575 15 Claims

1. A coronametric instrument responsive to first and second fields of view slightly removed from the sun comprising a first

optical axis adapted to be pointed at the center of the sun, a second optical axis slightly angularly displaced from the first axis and adapted to be pointed at the center of the second field of view, said first and second axes having an intersection point, means forming an entrance aperture at the intersection



point, first and second image planes respectively on said first and second axes, both of said image planes being behind the entrance aperture, occulting disc means on the first axis for blocking the direct rays of the sun from falling onto the first image plane, and a lens system for respectively imaging first and second fields of view on the first and second image planes.

3,979,597

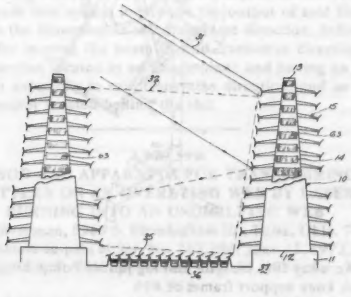
SOLAR POWER PLANT

Ernest R. Drucker, 86 Saginaw Crescent, Ottawa, Canada (K2E 5N7)

Continuation-in-part of Ser. No. 447,361, March 5, 1974. This application Mar. 10, 1975, Ser. No. 557,181

Int. Cl.² F24J *3/02;* **F03G** *7/04*

U.S. Cl. 290—55 **7 Claims**



1. A solar energy powerplant comprising a group of seven or more vertical towers open at both ends, said towers being mounted on a base structure in an equally spaced configuration with a single central tower surrounded by at least six towers, a plurality of vertically spaced, radially projecting heating chambers mounted externally on each tower, said chamber projecting from the tower a distance at least equal to the radius of the tower, with the chamber at each level being divided into a series of segment-shaped compartments separated by radial divider walls, each said segment-shaped compartment having an inlet for ambient air and an outlet into the tower for heated air, tiltable concave mirrors mounted on the outermost edges of the segment-shaped compartments and wind-powered impellers mounted in at least the upper half of each tower in vertically spaced locations in association with said heating chambers, said impellers being adapted to drive electrical generating units.

3,979,598

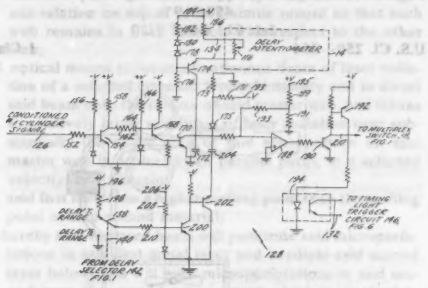
DUAL RANGE ADJUSTABLE DELAY CIRCUIT

Richard F. Lach, Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 26, 1975, Ser. No. 562,075

Int. Cl.² H03K *17/28*

U.S. Cl. 307—294 **2 Claims**



1. A circuit for adjusting the delay between a pulsed input signal and the output from said circuit within two selectable delay ranges, comprising

means for differentiating said input signal and producing a differentiated signal,

a normally nonconducting first transistor,

a first capacitor connected with said first transistor,

a variable current source including an adjustable resistor,

means connecting said variable current source to supply current to said first transistor and to said first capacitor, said first capacitor being charged by said variable current source when said first transistor is nonconducting,

a comparator,

means connecting said first capacitor to said comparator whereby said comparator produces a first voltage output when said capacitor is charged to a predetermined voltage,

means connecting said differentiated signal with said first transistor, said differentiated signal causing conduction of said first transistor and discharge of said first capacitor therethrough, discharge of said first capacitor reducing the voltage on said first capacitor below said predetermined voltage whereby said comparator produces a second voltage output, said first transistor returning to its nonconducting state upon termination of said differentiated signal and permitting said first capacitor to charge to said predetermined voltage whereby said comparator produces said first voltage output,

and means including a selectively gated on-off switch for connecting a second comparator in parallel with said first capacitor, thereby to provide said circuit with two delay ranges, the longer one of sad ranges being provided when said switch is gated on.

3,979,599

OPERATIVELY INTERLOCKED ELECTRONIC SYSTEM

Yoshio Amemiya, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed May 5, 1975, Ser. No. 574,454

Claims priority, application Japan, May 10, 1974, 49-52033

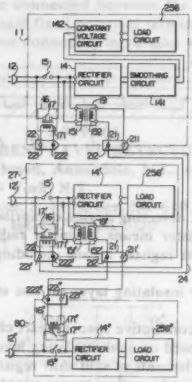
Int. Cl.² H02J *3/00*

U.S. Cl. 307—29 **5 Claims**

1. An operatively-interlocked electronic system comprising: a first electronic apparatus including a first AC power supply, a rectifier circuit to which electric power is supplied from said first AC power supply, a first load circuit to which the output of said rectifier circuit is applied, a manual power switch inserted in the line connecting said first AC power supply to said first load circuit through

said rectifier circuit, and a first generator circuit connected to said first AC power supply for decreasing the voltage of said AC power supply and generating a control signal;

a second electronic apparatus including a second power supply, a secoond load circuit and a first automatic switch inserted between said second power supply and said second load circuit;



means for applying the output signal from said signal generator circuit to said first automatic switch when said manual power switch is closed; and

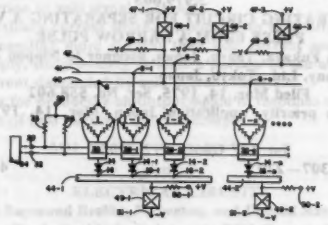
means for supplying electric power from said second power supply to said second load circuit by closing said first automatic switch in response to said control signal.

3,979,600

SENSE CIRCUIT ARRANGEMENT

Oliver D. Bohning, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 14, 1974, Ser. No. 523,598
Int. Cl.² G01R 17/10
U.S. Cl. 307—125 **12 Claims**



1. A sense circuit including

a bridge arrangement comprised of first impedance means,

the impedance of said bridge arrangement adapted to change in response to a condition to be sensed,

first source means connected to energize said bridge arrangement,

second source means,

third source means,

a differential amplifier connected between said bridge arrangement and said second source means to receive a signal from said bridge arrangement in response to a change in the impedance of said first impedance means,

second impedance means electrically connected between said third source means and said differential amplifier so as to provide a signal related to the signal received by said differential amplifier, and

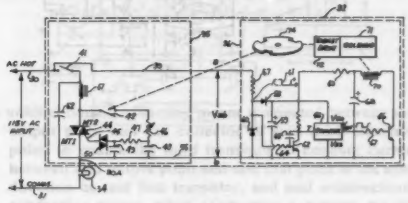
output terminal means connected to said differential amplifier and said second impedance means to provide a signal in response to the operation of said differential amplifier to thereby indicate a change in the impedance of said bridge arrangement.

3,979,601

COMBINATION DIMMER AND TIMER SWITCH MECHANISM

Robert C. Franklin, 914 Bicknell Road, Los Gatos, Calif. 95030

Filed Feb. 10, 1975, Ser. No. 548,876
Int. Cl.² H01H 7/00
U.S. Cl. 307—141 **8 Claims**



1. A combination for controlling power flow from an electrical power source through an electrical circuit to an electrical powered device, said combination comprising:

a dimmer control connected in the circuit for regulating the magnitude of power flow to the device;

a secondary on-off switch for interrupting power flow from the dimmer control to the device;

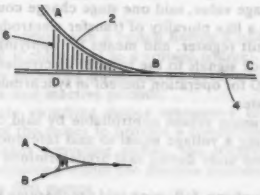
an electrical timer circuit with means for actuating said secondary switch according to a predetermined timed sequence, said electrical timer circuit including input power terminals connected across said dimmer control for utilization of the voltage drop thereacross for energizing the electrical timer circuit.

3,979,602

RESISTIVE NEURISTOR JUNCTIONS

Stanley A. Reible, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Sept. 30, 1974, Ser. No. 510,646
Int. Cl.² H03K 19/08
U.S. Cl. 307—201 **11 Claims**



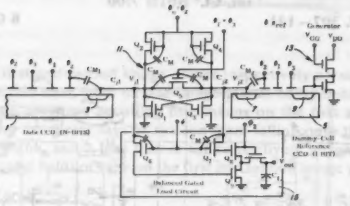
1. A junction for coupling one neuristor line to another comprising a relatively high resistance path for coupling one neuristor line to another at a point of first juncture and a relatively low resistance path for coupling said one neuristor line to said another at a point of second juncture.

3,979,603

REGENERATIVE CHARGE DETECTOR FOR CHARGED COUPLED DEVICES

William Milton Gosney, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 22, 1974, Ser. No. 499,717
Int. Cl.² H03K 5/18, 5/20, 3/286; H01L 29/78
U.S. Cl. 307—221 D 7 Claims



1. In a charge coupled device shift register including a plurality of stages, each having a plurality of transfer electrodes, means for applying multi-phase clock signals to said electrodes to shift data signals along said shift register, data output means for said shift register adjacent a selected electrode of one of said stages, said selected transfer electrode connected for application of a predetermined phase clock signal thereto; regenerative charge detector means comprising in combination:

bi-stable circuit means comprising a pair of cross-coupled inverter stages connected between a first voltage supply line, and a second voltage supply line comprising a fixed supply voltage line, said bi-stable circuit having first and second nodes;

said output means of said shift register connected to said first node;

means for precharging the first and second nodes to a reference voltage set by a value $V_{out} = V_{in}$ on an output voltage(V_{out}) versus input voltage (V_{in}) transfer characteristic of said inverter stages;

transmission means including a one stage charge coupled device connected between said second node and a voltage source for generating a voltage equal to said reference voltage value, said one stage charge coupled device including a like plurality of transfer electrodes as a stage of said shift register, and means for applying said multiphase clock signals to the transfer electrodes of said one stage CCD for operation thereof in synchronism with said shift register.

said transmission means controllable by said clock signals for applying a voltage equal to said reference voltage to said second node during said predetermined clock signal phase;

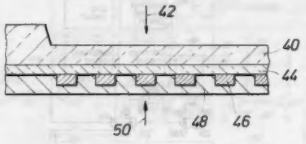
means for applying, following said precharging step, the said predetermined phase clock signal to each of said selected transfer electrode, said first supply line and said transmission means, for transferring a data signal to the output means of said shift register to cause regenerative imbalance between the voltages at said first and second nodes in a sense corresponding to the level of said transferred data signal compared with that of said reference voltage.

3,979,604

INFRARED CHARGE-COUPLED IMAGER

Robert T. Bate, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 388,845, Aug. 16, 1973, abandoned.
This application Feb. 24, 1975, Ser. No. 552,520
Int. Cl.² H01L 31/10
U.S. Cl. 307—221 D 10 Claims



1. An infrared detecting device comprising charge coupled device shift register means having a radiation illumination surface, said shift register means including a semiconductor substrate;

an electrically insulating layer on one surface of said substrate;

a plurality of conductive spaced apart charge transfer electrodes disposed on said insulating layer to define optical resolution elements of said shift register means;

infrared energy absorption means adapted to absorb infrared energy having a wavelength sufficiently long that the semiconductor material of said substrate is substantially transparent to said radiation overlying said electrode means in cooperative relation with said illumination surface and comprising an insulative layer having a thickness sufficient for absorbing said pattern of infrared energy to generate a corresponding spatial thermal pattern in said layer thereby causing a corresponding pattern of electrical charge integration at said optical resolution elements of said shift register means; and

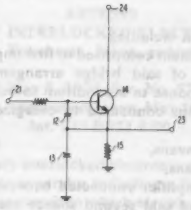
means for exposing said illumination surface to a spatially varying pattern of infrared radiation for transmission to the infrared absorption means substantially in the absence of radiation having a wavelength which is absorbed by the semiconductor material of said substrate.

3,979,605

INTEGRATING CIRCUIT FOR SEPARATING A WIDE PULSE FROM A NARROW PULSE

Hirokazu Fukaya, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Mar. 14, 1975, Ser. No. 558,602
Claims priority, application Japan, Mar. 14, 1974, 49-29416
Int. Cl.² G06G 7/12; H03K 5/20
U.S. Cl. 307—229 4 Claims

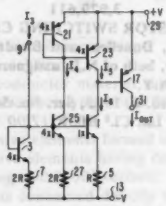


1. An integrating circuit comprising:

a transistor having an emitter, a base and a collector

a first resistor having its one terminal connected to the base of said transistor,
an input terminal connected to the other terminal of said first resistor,
a power supply terminal connected to the collector of said transistor,
a fixed potential terminal connected to a constant potential,
a first capacitor connected between the base and the emitter of said transistor,
a second resistor connected between the emitter of said transistor and said fixed potential terminal,
a second capacitor connected in parallel with said second resistor, and
an output terminal coupled to the emitter of said transistor.

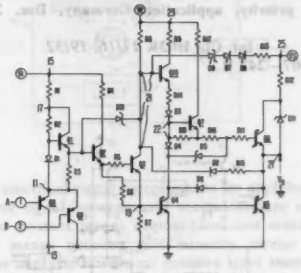
3,979,606
CURRENT LEVEL DETECTOR
Adel Abdel Aziz Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Sept. 5, 1975, Ser. No. 610,672
Int. Cl.² H03K *5/20*
U.S. Cl. 307—235 T **24 Claims**



1. A signal current level detector comprising, in combination:
a current sink controlled by said signal current for demanding a current in one proportion to said signal current when the latter is smaller than a given value, and in a second proportion to said signal current when the latter is greater than said given value;
a current source controlled by said signal current, for supplying a current to said current sink in at least one proportion to said signal current;
an auxiliary current source responsive to said current sink demanding more current than said current source can supply, for providing at least a portion of the additional current demanded by said current sink; and
means for producing an output signal in response to operation of said auxiliary current source.

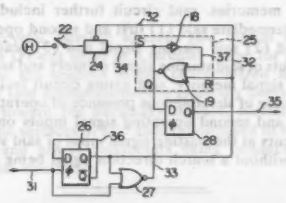
3,979,607
ELECTRICAL CIRCUIT
Howard Raymond Beelitz, Princeton, and Donald Ray Preslar, Somerville, both of N.J., assignors to RCA Corporation, New York, N.Y.
Filed Oct. 23, 1975, Ser. No. 625,039
Int. Cl.² H03K *5/08*, *19/08*
U.S. Cl. 307—237 **9 Claims**

1. The combination comprising:
an output point and first and second points of operating potential;
a first transistor connected at its collector to said output point and at its emitter to said first point;
a second transistor having its collector-to-emitter path connected between said output point and said second point;
a third transistor connected at its base and emitter, by negligible impedance means to the base and emitter, respectively, of said first transistor; and means coupling the collector of said third transistor to the base of said second transistor;
means for supplying a turn on current to the bases of said first and third transistors;
collector current limiting impedance means connected between the collector of said third transistor and a point of fixed potential; and



a unidirectional conducting means connected between said output point and the collector of said third transistor poled to enable the third transistor to conduct current between said output point and said first point in the same direction as said first transistor, and said unidirectional conducting means, when conducting a current, turning off said second transistor.

3,979,608
SOLID STATE BINARY LOGIC SIGNAL SOURCE FOR ELECTRONIC TIMEPIECE OR THE LIKE
Fukuo Sekiya, Tokorozawa, and Shigeru Morokawa, Higashiyamato, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Nov. 11, 1975, Ser. No. 630,821
Claims priority, application Japan, Nov. 14, 1974, 49-131257
Int. Cl.² H03K *17/60*
U.S. Cl. 307—247 A **8 Claims**



1. In combination with a switch having a pair of contacts, one of which is connected to a voltage source:
first means providing pulses having predetermined lengths of active and inactive periods;
a solid state switching device responsive to the inactive period of the pulses to provide a conduction path;
second means providing pulses, the triggering edges of which occurring within the inactive periods of the pulses from the first means;
a flip-flop having a set input terminal connected to the other contact of the switch via the conduction path of the solid state switching device, a reset input terminal connected to the first means to reset the flip-flop during the active periods of the pulses therefrom; and
a D flip-flop having a data input terminal connected to the output of the first mentioned flip-flop and a clock input

terminal connected to the second means to trigger the D flip-flop at the triggering edges of the pulses therefrom.

3,979,609

STATION FINDER CIRCUIT FOR TWO DIRECTIONS

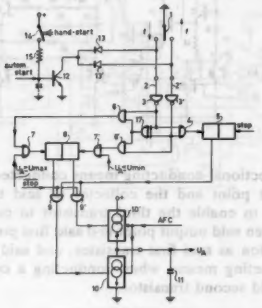
Udo Schillhof, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 11, 1974, Ser. No. 531,713

Claims priority, application Germany, Dec. 20, 1973, 2363349

Int. Cl.² H03K 17/16, 19/32

U.S. Cl. 307—247 R **5 Claims**



1. A search tuning circuit for two search directions comprising a starting signal memory having a starting signal input, a search direction signal memory having first and second operating signal inputs, first and second starting signal inputs, each starting signal input being coupled to said starting signal input of said starting signal memory and to said first and second search direction signal inputs of said search direction signal memory, said circuit being responsive to an operating signal at an operating signal input to write a search direction signal for a certain search direction and a starting signal in the corresponding memories, said circuit further including a gating circuit intermediate said (1) first and second operating signal inputs and (2) said starting signal and (3) search direction signal inputs of said starting signal memory and said (4) search direction signal memory, said gating circuit including means which in case of simultaneous presence of operating signals at said first and second operating signal inputs only a starting signal occurs at the starting signal input of said starting signal memory without a search direction signal being generated.

3,979,610

POWER REGULATOR CIRCUIT

Robert Gordon, Palm Beach Gardens, Fla., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jan. 27, 1975, Ser. No. 544,247

Int. Cl.² H03K 17/00

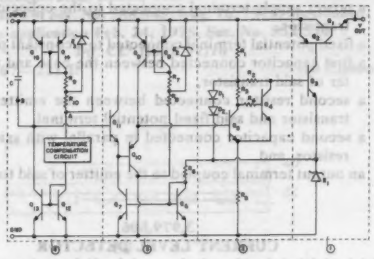
U.S. Cl. 307—297 **4 Claims**

1. A monolithic integrable power regulator circuit for supplying an effective constant voltage to instrument gauges comprising:

a switching amplifier having an output voltage which corresponds to said effective constant voltage;

a trigger circuit for driving said switching amplifier;

means responsive to said output voltage for triggering said switching amplifier ON when said output voltage has a first predetermined value for a first predetermined duration and for triggering said switching amplifier OFF when said output voltage has a second predetermined value for a second predetermined duration; and



buffer means coupled between said responsive means and said trigger circuit.

3,979,611

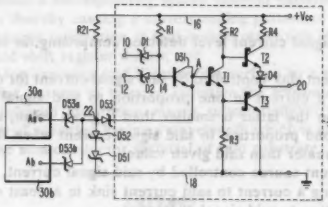
TRANSISTOR SWITCHING CIRCUIT

Michael Ian Payne, Dunellen, and Bhadrik Subodhchandra Dalal, Piscataway, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 6, 1975, Ser. No. 547,634

Int. Cl.² H03K 17/00

U.S. Cl. 307—300 **8 Claims**



1. In a circuit including a transistor whose emitter is coupled to a point of fixed potential and a PN junction, which exhibits capacitance when reverse biased, connected between a first node and the base of said transistor and being poled so that its forward direction is the same as the forward direction of the base-to-emitter region of said transistor, and wherein in response to a turn-off signal transition at said first node, having sufficient amplitude and polarity to reverse bias said PN junction, said transition is coupled through the capacitance of said PN junction to the base of said transistor and turns it off;

the improvement comprising:

a source of potential; and

a unidirectional conducting means, connected between said source of potential and the base of said transistor, poled in a direction to couple said potential source to said base through a relatively low impedance in response to said turn-off signal transition, for preventing the forward bias between the base-and-emitter of said transistor from decreasing below a predetermined level, where said predetermined level is less than the turn-on point of said transistor; and said unidirectional conducting means being rendered non-conductive and isolating said base from said source of potential in response to a turn-on signal at said first node.

3,979,612

V-GROOVE ISOLATED INTEGRATED CIRCUIT MEMORY WITH INTEGRAL PINCHED RESISTORS

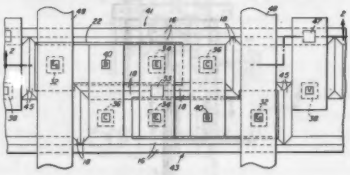
John L. Mudge, Los Altos; Jerry W. Zimmer, Mountain View, and Keith G. Taft, Ben Lomond, all of Calif., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 418,152, Nov. 21, 1973, abandoned, which is a division of Ser. No. 242,534, April 10, 1972, Pat. No. 3,818,289. This application Apr. 10, 1975, Ser. No. 566,889

The portion of the term of this patent subsequent to June 18, 1991, has been disclaimed.

Int. Cl.[2] H01L *27/04*

U.S. Cl. 307—303 7 Claims



1. An integrated circuit comprising:

a semiconductor substrate;

a layer of semiconductor material supported on said substrate having a surface lying in the [100] crystallographic plane;

a plurality of active elements formed in said layer;

each of said active elements having emitter base junctions extending along said [100] surface;

resistive elements connected directly to collector portions of said active elements directly through said semiconductor layer with the major portions of said resistive elements lying between said substrate and base to collector junction regions of said active elements;

isolation regions extending through said layer along [111] crystallographic surfaces, separating at least portions of said active semiconductor elements, and defining the major portions of the peripheries of said resistive elements;

means producing a substantially constant voltage bias across a plurality of said active elements connected in series through said layer; and

at least one of said junctions in said layer forming an emitter base junction of a transistor whose collector junction is formed between said substrate and said layer.

3,979,613

MULTI-TERMINAL CONTROLLED-INVERSION SEMICONDUCTOR DEVICES

Harry Kroger, Sudbury, and Horst A. R. Wegener, Carlisle, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed June 18, 1975, Ser. No. 587,939

Int. Cl.[2] H03K *3/353*

U.S. Cl. 307—304 24 Claims

1. Controlled inversion semiconductor circuit means comprising:

semiconductor body means having first and second spaced surface means,

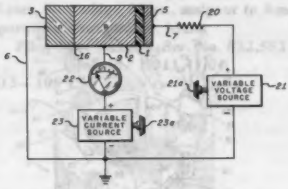
non-linear resistive layer means affixed to said first surface means,

conductive layer means affixed to said non-linear resistive layer means opposite said semiconductor body means,

first electrical signal source means for applying a first control signal between said conductive layer means and said second surface means,

minority carrier generator means within said semiconductor body means for generating an inversion layer within said semiconductor body means at said non-linear resistive layer means when said first control voltage reaches a predetermined threshold value,

said non-linear resistive layer means tending to prevent formation of said inversion layer when said first control signal remains below said predetermined threshold value,



second electrical signal source means for applying a second control signal between said second surface means and ohmic contact means disposed on said semiconductor body means between said minority carrier generator means and said non-linear resistive layer means for further controlling the supply of minority carriers reaching said inversion layer, and

utilization means in series relation with said first electrical signal source means and said conductive layer means.

3,979,614

DT CUT, CONTOUR MODE PIEZOELECTRIC CRYSTAL

Satoshi Toyoda, Tokyo, Japan, assignor to Kinsekisha Laboratory, Ltd., Tokyo, Japan

Filed Oct. 21, 1974, Ser. No. 516,440

Claims priority, application Japan, Oct. 24, 1973, 48-119582

Int. Cl.[2] H01L *41/04*

U.S. Cl. 310—9.5 3 Claims

1. In a crystal element wherein said crystal element is formed with DT-cut angle in a circular shape for generating vibrations in the contour mode, characterized in that the thickness of said crystal element is gradually decreased from the center toward the periphery thereof, electrodes being applied to the surfaces of said element opposed to each other, supporting and power conductors being connected to the center of said electrodes.

3,979,615

FIELD ASSEMBLY FOR ELECTRIC MOTORS

Nelson Edward Neff, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 5, 1975, Ser. No. 547,322

Int. Cl.[3] H02K *11/00*

U.S. Cl. 310—71 18 Claims

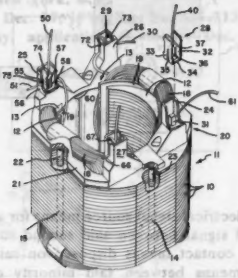
1. An assembly comprising an iron core formed of a stack of annular laminations each having at least two lamination alignment holes therein and at least one coil wound thereon with at least one coil wire end, and connector means constructed to connect said coil ends to external conductors with said connector means comprising:

a unitary, insulative housing comprising a base having a shape similar to at least a portion of the annular laminations of said iron core and mounted concentrically upon one end of said stack of laminations, and extending

around said one end at least the angular distance between adjacent lamination alignment holes;

at least one contact means;

said insulative housing further comprising at least one contact retaining means constructed to retain one of said contact means; and



appendages on said housing base for securing said housing base to said at least two lamination alignment holes in said laminations and to align said housing with respect to said iron core;

each of said contact means constructed to secure and make electrical contact with at least one coil end and at least one external conductor.

3,979,616

UNIPOLAR ROTARY STEP MOTOR

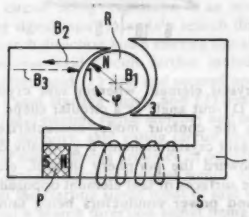
Helmut Stechmann, Schwenningen, Germany, assignor to Kienzle Uhrenfabriken GmbH, Schwenningen, Germany

Filed Feb. 13, 1974, Ser. No. 442,286

Claims priority, application Germany, Feb. 19, 1973, 2308053; Dec. 8, 1973, 2361217

Int. Cl.² H02K 37/00

U.S. Cl. 310—49 R 1 Claim



1. A rotary step motor comprising:

a stator defining an air gap with opposed poles at said air gap,

a rotor supported for rotation in said stator air gap, said rotor comprising a permanent magnet means and with the air gap between each pole and the rotor decreasing in the direction of rotor rotation,

a control coil for said stator for magnetizing said stator with one polarity of magnetization in response to each of a succession of unidirectional pulses applied to said control coil,

said stator defining adjacent said air gap a recess for receiving a further permanent magnet means for magnetizing said stator with a polarity of magnetization opposite to that provided by said control coil,

said magnetization provided by said control coil when energized by one of said unidirectional pulses being greater than that provided by said further permanent magnet means,

whereby the application and also the removal of each of a plurality of said unidirectional pulses to said control coil produces a predetermined amount of rotation of said rotor.

3,979,617

ELECTRICAL ROTARY SPEED SIGNAL GENERATOR

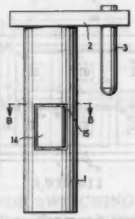
Dieter-Helmut Thom, Ketsch, Germany, assignor to Teldix GmbH, Heidelberg, Germany

Filed Sept. 2, 1975, Ser. No. 609,513

Claims priority, application Germany, Sept. 13, 1974, 2443862

Int. Cl.² H02K 21/26

U.S. Cl. 310—168 11 Claims



1. An electrical rotary speed signal generator for producing an electrical signal which represents the angular speed of two components, one of which is rotatable with respect to the other, said generator comprising a rotor for mounting on the rotary component, a stator for mounting on the stationary component opposite a part of said rotor, means in said stator for detecting rotary movement of said rotor and for providing an output signal representative of the angular speed thereof, a non-metallic housing for said stator for insertion with said stator into a bore in the stationary component and at least two peripherally spaced high strength bearing bodies for said non metallic housing adapted for engagement with the wall of the bore in the stationary component with at least one of said two bearing bodies being radially elastically flexible for producing frictional adhesion between said stator and said bore.

3,979,618

TWO LAYER WINDING FOR ELECTRIC MACHINES

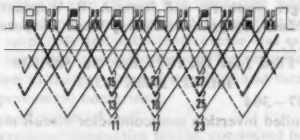
Herbert Auinger, Nurnberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 356,298, May 2, 1973, abandoned.

This application Dec. 11, 1974, Ser. No. 531,697

Int. Cl.² H02L 3/00

U.S. Cl. 310—198 11 Claims



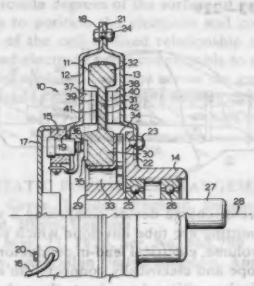
1. A two layer cord winding for an electric machine having a plurality of slots for receiving windings, each of said slots being of the same depth, sized to accommodate two slot layers of full coils and being equally spaced, comprising, for each phase circuit in the machine, a first plurality of full coils having a number of turns which fills a slot layer and a second plurality of half coils with a reduced number of turns said first and second pluralities filling all slots in such a manner that each half coil placed in a slot layer having the rest of its volume occupied by a half coil of a different circuit.

3,979,619

PERMANENT MAGNET FIELD STRUCTURE FOR DYNAMOELECTRIC MACHINES

Eric Whiteley, Peterborough, Canada, assignor to Canadian General Electric Co., Ltd., Toronto, Canada

Filed Aug. 30, 1974, Ser. No. 502,007
Claims priority, application Canada, Sept. 24, 1973, 181935
Int. Cl.² H02K 1/22
U.S. Cl. 310—268 12 Claims



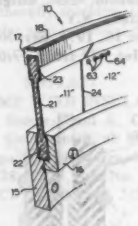
1. A discoidal type dynamoelectric machine comprising at least two relatively rotatable members separated by an axial gap; means defining at least one closed magnetic flux path included in said members and said gap; an electric winding linked electromagnetically with said path; and a mosaic of at least one layer of two or more unit permanent magnets per layer mounted on one of said relatively rotatable members and located in said path for producing magnetic flux therein oriented axially in said gap.

3,979,620

SEGMENTAL DISCOIDAL WINDING STRUCTURE FOR DYNAMOELECTRIC MACHINES

Eric Whiteley, Peterborough, Canada, assignor to Canadian General Electric Co., Ltd., Toronto, Canada

Filed Mar. 11, 1975, Ser. No. 557,425
Claims priority, application Canada, July 3, 1974, 203913
Int. Cl.² H02K 1/22
U.S. Cl. 310—268 6 Claims



1. A discoidal winding structure for use in an axial gap dynamoelectric machine consisting essentially of a plurality discrete winding segments each having multiple complete coils overlapped in a circular array, interconnected electrically and bonded together with a bonding medium to provide a rigid segmental structure; means for securing said segments together in a unitary discoidal winding structure having an annular disc portion containing the coil sides and ring portions on the inner and outer edges of the disc portion containing the coil end-heads and coil end conductors; means for interconnecting said segments electrically; each one of said segments containing a fractional number of the winding coils and having surfaces mating with complementary surfaces on the adjoining segments, and each one of said surfaces being located at a segment end coil such that said end coils assume the same relative positions in the discoidal winding structure as the other coils.

3,979,621

MICROCHANNEL PLATES

Colin K. Yates, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed June 4, 1969, Ser. No. 832,552
Int. Cl.² H01J 43/04
U.S. Cl. 313—105 CM 5 Claims

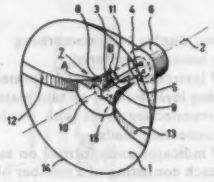
1. A channel plate comprising:
a web structure of glass having a multiplicity of juxtaposed channels extending through said structure from one face to another face thereof, said channels having inner walls formed of lead-containing glass each surrounded by and fused to a matrix glass having a higher softening point than that of said lead-containing glass; and
a rim of solid glass extending around and fused to said web structure.

3,979,622

HEADLIGHT AND INCANDESCENT LAMP FOR ANTI-DAZZLE BEAM

Johannes Rijnders, Boxtel, and Harry William Jelle Iedema, The Hague, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 1, 1974, Ser. No. 465,887
Claims priority, application Netherlands, May 1, 1973, 7306006
Int. Cl.² H01K 1/26, 1/32, 7/02
U.S. Cl. 313—117 8 Claims



1. A lamp which comprises a reflector formed as a paraboloid of revolution within which a helically wound filament for a beam is disposed with the axis thereof parallel to the reflector axis, a cap disposed about a radial sector of said filament, said cap having first and second curvilinear edges, said edges lying in the first and second planes, said first and second planes intersecting at the axis of said filament, the distance from at least one of the edges of the cap to the axis of the filament measured in a first plane which passes through the end of the filament remote from the rear end of the reflector and which extends transversely to the axis of the filament, is larger than the distance from the edge of the cap to the axis of the filament measured in any other plane which extends transversely to the axis of the filament and is disposed between

said first plane and the rear end of the reflector, at least one of the edges of the cap has a curved shape whose centers of curvature are situated on the side of the cap edge remote from the filament.

3,979,623

INDICATOR DISPLAY TUBE

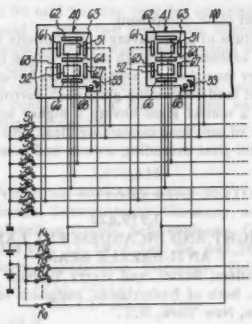
Yuzuru Yanagisawa, Fujisawa; Akio Ohgoshi, Akira Nakayama; Akira Nakayama, Tokyo, and Shoichi Muramoto, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 177,990, Sept. 7, 1971, abandoned. This application June 4, 1973, Ser. No. 365,334

Claims priority, application Japan, Sept. 11, 1970, 45-80378

Int. Cl.² H01J 61/68

U.S. Cl. 313—190 4 Claims



1. An indicator display tube comprising:
a plate of an insulating material;
a plurality of interconnecting leads formed on said plate;
a first insulating layer formed on said plate over said plurality of interconnecting leads with windows aligned with said interconnecting leads;
a plurality of indicator units formed on said first insulating layer and each consisting of a number of strip conductive coplanar anode and cathode segments and a plurality of selecting leads on said first insulating layer coplanar with said indicator units and said selecting leads connected to corresponding ones of said interconnecting leads through said windows respectively;
a planar barrier electrode means of electrically conductive material formed on said first insulating layer and formed with openings in which said associated strip conductive anode and cathode segments of said indicator units are mouted and said barrier electrode means coplanar with said anode and cathode segments;
a second insulating layer formed on said selecting leads;
a transparent cover attached to said plate and forming an envelope for enclosing said indicator units and barrier electrode means; and
an ionizable gas sealed in said envelope.

3,979,624

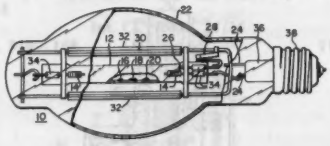
HIGH-EFFICIENCY DISCHARGE LAMP WHICH INCORPORATES A SMALL MOLAR EXCESS OF ALKALI METAL HALIDE AS COMPARED TO SCANDIUM HALIDE

Chi-sheng Liu, Monroeville; Chikara Hirayama, Murrysville; Robert J. Zollweg, Monroeville, and Ronald A. Madia, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 29, 1975, Ser. No. 572,809

Int. Cl.² H01J 61/18

U.S. Cl. 313—229 8 Claims



1. An arc-discharge device comprising a sealed elongated light-transmitting arc tube envelope which encloses a predetermined volume, electrical lead-in conductors sealed through said envelope and electrically connected to electrodes which are operatively positioned proximate the ends of said envelope and spaced apart a predetermined distance within said envelope, and a discharge-sustaining filling enclosed by said envelope and having the following as essential constituents: mercury in predetermined amount as required to provide a mercury-vapor pressure in said envelope of from one to ten atmospheres as calculated on the basis of mercury being fully vaporized as the sole discharge-sustaining constituent with an average mercury vapor temperature of 2000°K; a small charge of inert ionizable starting gas; alkali metal halide of sodium iodide or sodium bromide or lithium iodide or lithium bromide or any mixtures thereof; scandium halide of scandium iodide or scandium bromide or any mixtures thereof, wherein the molar ratio of said alkali metal halide to said scandium halide is from about 1.7:1 to about 5:1; and said alkali metal halide plus said scandium halide is present in said arc tube envelope in total amount of at least about 0.1 mg/mm of spacing between said electrodes.

3,979,625

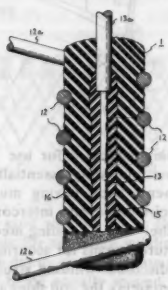
CERAMIC SPACED SENSOR ASSEMBLY FOR A GAS LEAK DETECTOR

John A. Roberts, Lynnfield, Mass., assignor to General Electric Company, Schenectady, N.Y.

Filed June 10, 1975, Ser. No. 585,643

Int. Cl.² H01J 27/00

U.S. Cl. 313—230 9 Claims



1. A sensor assembly for a halogenated gas leak detector comprising a helical heater coil formed of platinum wire having a thickness in a range of 1 to 3 mils, an elongated electrode positioned within said coil substantially parallel to the longitu-

dinal axis thereof, said electrode being formed of platinum wire having a diameter in the range of 0.5 mil to 2 mils, a coating of cured porous ceramic material deposited on the portion of said electrode disposed within the coil to stiffen and insulate the electrode, an alkali metal salt selected from the class including rubidium carbonate and sodium carbonate being disposed in the pores of said ceramic material, and a block of cured porous cement formed tightly around the coating on said central electrode and around at least the innermost 120 arcuate degrees of the surface of each turn of said coil thereby to position the electrode and coil and the respective turns of the coil in fixed relationship to one another, said coil and electrode being connectable to a source of electric energy for applying a voltage across the gap between the coil and electrode and for supplying heating current to the coil.

3,979,626

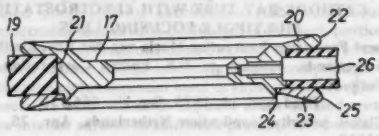
ELECTROSTATIC FOCUSING ARRANGEMENTS

Michael Curzon Green, London, England, assignor to Emi-Varian Limited, Hayes, England

Filed Mar. 27, 1975, Ser. No. 562,789

Claims priority, application United Kingdom, Apr. 2, 1974, 14486/74

Int. Cl.² H01J 1/53

U.S. Cl. 313—240 **5 Claims**

1. An electron beam discharge tube having electron beam focusing means including first and second appertured co-operative electrodes, in operation of the tube maintained at a potential difference, and an insulating means, an extremity of the insulating means in contact with the second, apertured, beam focusing electrode, supporting the electrode in the tube electrically insulated from the first electrode, said second electrode having an extension of a conductive shield over the insulating means adjacent said extremity in contact with the second electrode and thereby shielding said insulating means against breakdown under said potential difference.

3,979,627

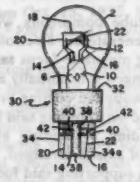
ELECTRIC LAMP WITH INSULATING BASE

Stephen J. Leadvaro, Salem; Paul E. Gates, Danvers, and Stephen F. Kimball, Georgetown, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Apr. 28, 1975, Ser. No. 572,609

Int. Cl.² H01J 5/48, 5/50

U.S. Cl. 313—318 **10 Claims**



1. An electric lamp comprising, in combination:

an hermetically sealed, light-transmitting envelope containing a pair of filaments and having a sealed portion at one end;

an insulating base member having a cavity that is larger than the sealed end portion of said envelope, a depending wedge-lock portion having opposed substantially flat sides with locating means, including a transverse lock-in means, disposed thereon, and four channels passing through said wedge-lock portion and communicating with said cavity, said sealed end portion of the envelope being secured within said base cavity; and

a respective pair of lead-in wires connected to each of said filaments, whereby four lead-in wires extend through the sealed end portion of said envelope and into the four respective channels in said base member, each of said lead-in wires having a terminal portion extending outwardly from the end of the wedge-lock portion of said base member, the terminal portions of a first pair of said lead-in wires being bent around the end of said wedge-lock portion and extending alongside and approximately parallel to one of the flat sides thereof and terminating past the transverse lock-in means thereon, and the terminal portions of a second pair of said lead-in wires being bent around the end of said wedge-lock portion and extending alongside and approximately parallel to the other of the flat sides thereof and terminating past the transverse lock-in means thereon.

3,979,628

METHOD OF MANUFACTURING AN ELECTRODE PROVIDED WITH CONNECTION

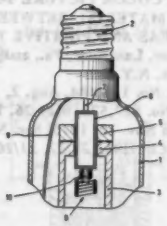
Johannes Jacobus Franciscus Geytenbeek, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 25, 1974, Ser. No. 509,140

Claims priority, application Netherlands, Oct. 4, 1973, 7313627

Int. Cl.² H01J 5/50

U.S. Cl. 313—331 **3 Claims**



1. A method of manufacturing a lamp having a generally helical electrode having a first melting point and an electrical connection conductor which comprises: providing a connection conductor having an elongated body of material having a second melting point lower than said first melting point, said body being formed for interfering engagement with the interior of said helix; positioning said elongated body within at least several turns of said helix; heating said connection conductor at the area of said several turns to a temperature intermediate said first melting point and said second melting point so that said connection conductor flows along the extent of the turns of the helical electrode engaging said body.

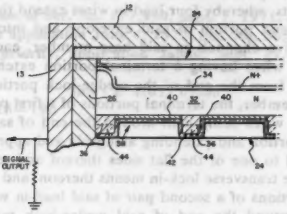
3,979,629
SEMICONDUCTOR WITH SURFACE INSULATOR HAVING IMMOBILE CHARGES

Hermann Statz, Wayland, and Wolfgang M. Feist, Burlington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 365,927, June 1, 1973, abandoned. This application Feb. 5, 1975, Ser. No. 547,161

Int. Cl.² H01J 29/45, 31/38

U.S. Cl. 313—367 **5 Claims**



1. A camera tube comprising:

an evacuated envelope;

an electron gun and a target structure supported within said envelope;

said target structure comprising a member of semiconductor material;

a plurality of junction regions formed on the side of said member facing said gun; and

first regions of insulating material disposed on said member of semiconductor material between said junction regions, said first regions of insulating material having immobile charges with a density in the range of 10^{13} to 10^{14} charges per square centimeter therein for inhibiting conduction through said member of semiconductor material between adjacent junction regions, and said first regions of insulating material being separated from said member of semiconductor material by second regions of insulating material.

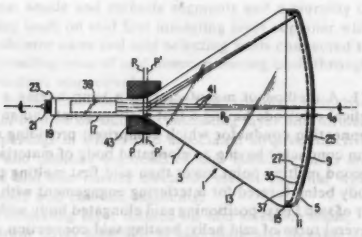
3,979,630
SHADOW MASK COLOR PICTURE TUBE HAVING NON-REFLECTIVE MATERIAL BETWEEN ELONGATED PHOSPHOR AREAS AND POSITIVE TOLERANCE

David Dale Van Ormer, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 168,484, Aug. 2, 1971, which is a continuation of Ser. No. 827,573, May 26, 1969, abandoned. This application Nov. 10, 1975, Ser. No. 630,596

Int. Cl.² H01J 29/32, 31/20

U.S. Cl. 313—408 **4 Claims**



1. In a color picture tube of the shadow mask type comprising an evacuated envelope including a transparent faceplate, a mosaic screen located on an inner surface of said faceplate, a multiapertured shadow mask mounted adjacent to but spaced from said screen, and means for generating and projecting electrons along a plurality of convergent paths through said mask and to said screen; said screen comprising a color phosphor layer comprising a multiplicity of spaced-apart color phosphor elements disposed in groups of different color light emitting elements, each group having the same number of elements as the number of said convergent paths, the elements of each group being respectively aligned with said convergent paths through one of the apertures of said mask; said screen further comprising a matrix layer of light absorbing material filling the entire space between said phosphor elements and having holes through which said elements are exposed through said faceplate;

the improvement comprising, said shadow mask including a multiplicity of spaced parallel elongated apertures in the form of slits;

said matrix layer including a multiplicity of spaced parallel elongated opaque elements forming elongated holes therebetween in which elongated color phosphor elements are located, the size of each of said matrix holes being larger than the size of the respective electron spot produced on said screen during operation of said tube and the light transmission of said faceplate being greater than 41%.

3,979,631
CATHODE RAY TUBE WITH ELECTROSTATIC MULTIPOLE FOCUSING LENS

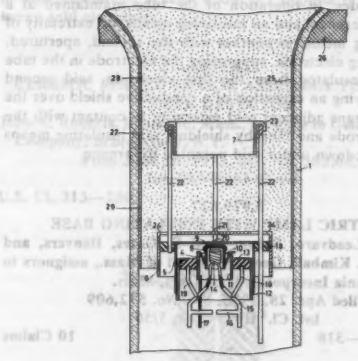
Robert Fransiscus Laurentius Maria van der Ven, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 10, 1975, Ser. No. 566,732

Claims priority, application Netherlands, Apr. 25, 1974, 7405552

Int. Cl.² H01J 29/02, 29/58, 29/62

U.S. Cl. 313—450 **8 Claims**

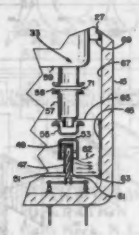


1. A cathode ray tube comprising within an evacuated envelope, means to generate an electron beam propagating along an axis, focusing means to focus said electron beam to a spot on a target arranged substantially at right angles to the axis, an electrically conductive coating provided on the interior of said envelope and surrounding said focusing means, said focusing means including a focusing electrode facing the target and a plurality of axially arranged, electrically conductive elongate members supporting said focusing electrode and being electrically connected thereto, said members in combination with said coating constituting an electrostatic multipole lens cooperating with said focusing electrode.

3,979,632
CATHODE RAY TUBE HAVING SURFACE CHARGE INHIBITING MEANS THEREIN

Everett A. Gunning, Lock Haven, Pa., and Charles H. Rehkopf, Seneca Falls, N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed July 17, 1974, Ser. No. 489,137
Int. Cl.² H01J 29/06, 31/00
U.S. Cl. 313—479 1 Claim



1. An improvement in a cathode ray tube having an envelope with a cathodoluminescent screen formed on the viewing panel portion, a conductive coating disposed on the funnel and upper neck portions, and a related multi-electrode electron generating assembly including at least one cathode, and associated control (G1), acceleration (G2), and focusing (G3) electrodes sequentially positioned in the neck portion in a manner to beam electrons to said screen, said improvement being neck surface charge inhibiting means comprising:

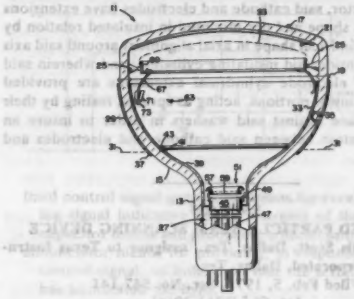
a definitive circumferential band of substantially roughened insulative oxide material disposed as an isolated area on the interior surface of said neck portion, said band being comprised of at least one material selected from the group consisting essentially of chromic oxide, ferric oxide, and a mixture of chromic-ferric oxides; the location of said band being substantially to the rear of said neck portion associated with substantially the cathode region of said electron generating assembly and oriented in a position to intercept metallic vaporization effused substantially from the cathode in the direction of the wall of said neck portion during tube processing and conditioning, the lower boundary of said band being in a plane beneath the open end of said cathode, and the upper boundary in a plane substantially in the region of said focusing electrode (G3) but rearward of the forward end thereof, said roughened insulative band effecting a discontinuous surface condition thereby providing a deterrent to the build-up of a deleterious negative surface charge on said neck portion emanating from substantially said cathode region.

3,979,633
DIRECTIONAL GETTER ATTACHED TO MULTI-APERTURED MEMBER

Charles A. Davis, Auburn, and Harry E. Smithgall, Seneca Falls, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation of Ser. No. 510,118, Sept. 27, 1974, abandoned.
This application Oct. 15, 1975, Ser. No. 622,497
Int. Cl.² H01J 29/07, 29/84, 31/00
U.S. Cl. 313—481 2 Claims

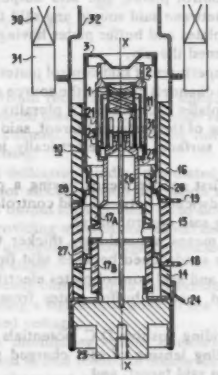
1. Means for effecting improved internal arc suppression in a cathode ray tube having an envelope formed of a sealed integration of neck, funnel and panel portions providing an enclosure for structural components including a multi-electrode electron generating assembly located in said neck portion in a manner to project at least one electron beam to traverse a multi-apertured member and impinge a cathodoluminescent screen disposed on the interior surface of said panel, the funnel portion having a low resistive electrical conductive coating disposed on the forward portion of the interior surface thereof and a high resistive electrical conductive coating interiorly disposed rearward therefrom to effect a substantially common electrical potential between the low resistive coating and the electron generating assembly while limiting the current and providing an arc suppression influence in the region of the electron generating assembly, said arc suppression improvement comprising: at least one getter element formed of a closed-loop open-channel structure positioned on a peripheral portion of said apertured member and oriented to disperse the getter effusion toward the interior of the funnel, said at least one getter element having a diffusion director in the form of a leaflike shield attached substantially to one side of the open getter channel in a manner to angularly shield the channel and direct the effusion therefrom toward substantially the apertured member and panel area, said getter element having a backing member to prevent rearward effusion of said getter material toward the coated sidewall of the funnel.



3,979,634
TRAVELLING-WAVE TUBE WITH AN IMPROVED ELECTRON GUN

André Jaillet; André Pelletier, and Jean-Pierre Thieulent, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 7, 1974, Ser. No. 521,885
Claims priority, application France, Nov. 13, 1973, 73.40299
Int. Cl.² H01J 25/34
U.S. Cl. 315—3.5 2 Claims



1. A travelling-wave tube comprising a vacuum casing terminating at one end in an electron collector and secured in

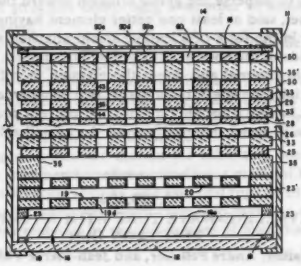
vacuum-tight manner at the other end to a socket closed by a tube base, the socket being made up of cylinders of insulating material stacked on top one another in axial alignment with interposition of metal washers, whose external diameter is substantially flush with said insulating cylinders, and which are used as contacts for the sources which energize the tube in operation, said tube further comprising an electron gun disposed in said socket, which gun is comprised of a cathode and electrodes cooperating with said cathode to produce an electron beam which travels axially along said axis and is collected by said collector, said cathode and electrodes have extensions of cylindrical shape and are mounted in insulated relation by spacers of cylindrical shape in axial alignment around said axis and located inside said insulating cylinders, and wherein said cathode and electrode cylindrical extensions are provided with frusto-conical portions, acting as springs, resting by their external surface against said washers in order to insure an electrical contact between said cathode and electrodes and said washers.

3,979,635

CHARGED PARTICLE BEAM SCANNING DEVICE

Warner Curtis Scott, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 5, 1975, Ser. No. 547,141
Int. Cl.² H01J 29/41
U.S. Cl. 315—12 R 14 Claims



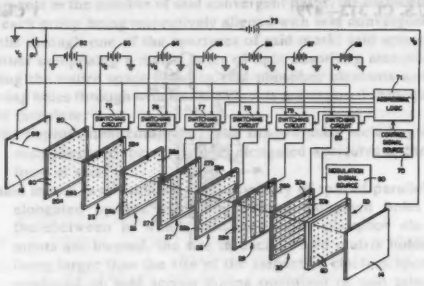
1. A charged particle beam scanning device comprising:
a source of charged particles,
an area target,
at least one input buffer plate, a plurality of control plates, and at least one output buffer plate, said input buffer plate, said control plates, and said output buffer plate sandwiched between said source and said target, each of said control plates and buffer plates having a plurality of apertures formed therein,
corresponding apertures of said control plates being aligned to form beam channels between the source and the target, said control plates each having a plurality of electrodes on at least one of the surfaces thereof, said electrodes on each of said surfaces being electrically insulated from each other,
a plurality of first spacer means having a predetermined thickness sandwiched between said control plates electrically isolating said control plates,
second spacer means anomalously thicker than said first spacer means sandwiched between said first and second buffer plates and said control plates electrically isolating said first and second buffer plates from said control plates,
means for providing positive D.C. potentials to said buffer plates providing lensing of said charged particles from said source to said target, and
means for selectively providing potentials to the electrodes on said control plates to selectively direct said charged particles to said target.

3,979,636

CHARGED PARTICLE BEAM SCANNING DEVICE

John E. Gunther, Lavon, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 21, 1974, Ser. No. 526,032
Int. Cl.² H01J 29/41
U.S. Cl. 315—12 R 13 Claims



1. A charged particle beam scanning device comprising:
an area source of charged particles for providing a uniform flow of charged particles over a predetermined area, said area source including elongated charged particle generating means for generating charged particles, a first electrode having a negative potential positioned behind said generating means, and a second electrode having a positive potential interdigitated with said first electrode, said first electrode divided into a plurality of segments,
an area target,
a plurality of control plates sandwiched between said source and said target for controlling the flow of charged particles therebetween, each of said control plates having a plurality of apertures formed therein, corresponding apertures of said control plates being aligned to form charged particles beam channels between the source and the target, said control plates each having a plurality of electrodes on at least one of the surfaces thereof, said electrodes on each of said surfaces being electrically insulated from each other,
means for providing potentials to at least one of the electrodes of each successive control plate to focus said charged particles through selected control plate apertures,
and means for providing a cutoff potential to the remaining electrodes of said control plates,
whereby a beam of charged particles is focused by said focusing potentials through the channels formed by said selected apertures.

3,979,637

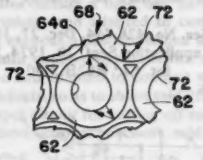
MICROCHANNEL PLATES AND METHOD OF MAKING SAME

Walter P. Siegmund, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Nov. 8, 1971, Ser. No. 199,816
Int. Cl.² H01J 29/41
U.S. Cl. 315—12 R 8 Claims

1. A multichannelled structure comprising;
a plate formed of at least two differently characterized glasses intimately bonded together by fusion;
a first of said glasses being at least partially conductive to electrical energy and comprising a multiplicity of individually spaced apart parallel tubular components each of substantial wall thickness, the opening internally of each tubular component forming a channel through said plate; and
a second of said glasses being an electrical insulating glass, said second glass comprising the structure of a web of

interconnected sections, one section encircling each tubular component with substantially less thickness of



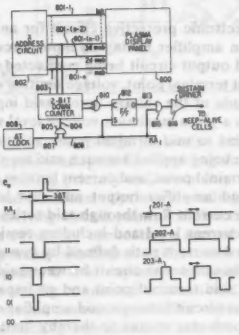
glass than said wall thickness of said tubular component in each case.

3,979,638

PLASMA PANEL WITH DYNAMIC KEEP-ALIVE OPERATION

Peter Dinh-Tuan Ngo, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 15, 1974, Ser. No. 460,757
Int. Cl.² H05B *37/00*
U.S. Cl. 315—169 TV **20 Claims**



1. A display system comprising
a panel of gas discharge display sites,
means operative for applying addressing signals to selected ones of said sites,
one or more preconditioning sources external to said sites, each of said sources being activatable to provide preconditioning flux at each of said sites to facilitate gas discharges thereat,
means operative for activating one or more ones of said sources in a time relation with respect to the operation of said applying means, and
means for varying said time relation as a function of the positions of said selected ones of said sites with respect to the positions of said one or more ones of said sources.

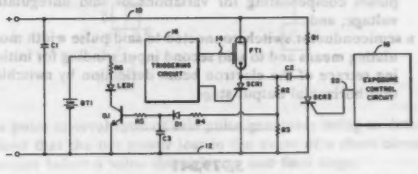
3,979,639

CORRECT EXPOSURE ANNUNCIATOR CIRCUIT

James R. Adams, Jr., Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 11, 1975, Ser. No. 603,564
Int. Cl.² H05B *41/32*; **G01J** *1/16*
U.S. Cl. 315—241 P **14 Claims**

1. Electronic flash apparatus comprising:
first control signal generating means for generating a first control signal;
second control signal generating means for generating a second control signal;
light producing means for producing light in response to the first control signal;
terminating means for terminating the light in response to the second control signal, the terminating means including terminating capacitor means which is discharged during the termination of the light;
terminating capacitor charging means for charging the terminating capacitor means;



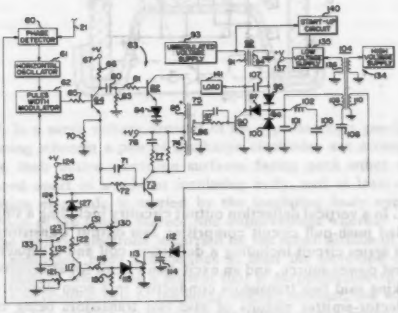
third control signal generating means for receiving a charging signal indicative of the charging of the terminating capacitor means and producing a third control signal; and
annunciator means for providing, in response to the third control signal, an indication that the terminating means has terminated the light.

3,979,640

HORIZONTAL DEFLECTION SYSTEM

Martin Fischman, Seneca Falls, and Jesse H. L'Hommedieu, Waterloo, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed July 30, 1975, Ser. No. 600,403
Int. Cl.² H01J *29/70*, *29/72*
U.S. Cl. 315—387 **10 Claims**



1. In a television receiver having a signal receiver, a video channel connected thereto, and a cathode ray tube connected to said video channel, a self-regulating horizontal deflection system comprising:
a horizontal deflection winding associated with said cathode ray tube for electron beam deflection therein;
a horizontal output stage connected to said deflection winding for providing a deflection signal thereto;
a source of unregulated voltage connected to said horizontal output stage;
feedback means connected to said horizontal output stage for providing a signal indicative of the magnitude of said unregulated voltage;
pulse width modulating means connected to said video channel and to said feedback means for providing a pulse signal synchronized with a composite video signal from said video channel and wherein the pulses are width modulated in accordance with the signal from said feedback means;

a transformer having an output winding connected to said horizontal output stage and first and second input windings;

a driver transistor connected to said pulse width modulating means and to said first input winding for applying the width modulated pulses to said first input winding with an amplitude and shape sufficient to drive said horizontal output stage to provide said deflection signal to said horizontal output winding, the width modulation of the pulses compensating for variations of said unregulated voltage; and

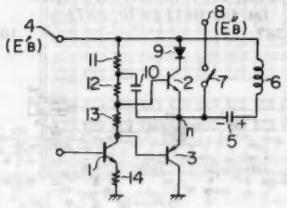
a semiconductor switch connected to said pulse width modulating means and to said second input winding for initiating retrace of the electron beam deflection by switching said horizontal output stage.

3,979,641

VERTICAL DEFLECTION OUTPUT CIRCUITRY FOR TELEVISION RECEIVER

Yoshihiro Arakawa; Akio Nakashima; Shunji Iwabuchi, and Kenji Ando, all of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed May 28, 1974, Ser. No. 474,025
Claims priority, application Japan, May 28, 1973, 48-59496
Int. Cl.² H01J 29/70
U.S. Cl. 315—397 8 Claims



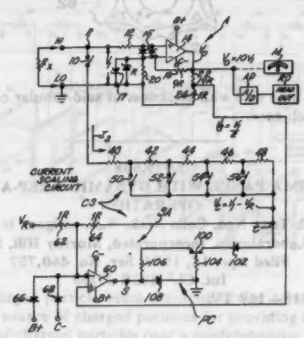
1. In a vertical deflection output circuitry including a single-ended push-pull circuit comprising two output transistors, a first series circuit including a deflection coil and a capacitor, a first power source, and an excitation circuit for alternatively making said two transistors conductive in a scan period, the collector-emitter circuits of said two transistors being connected in series with the same direction of current flow thereby to form a second series circuit, the output of said excitation circuit being coupled to the respective bases of said two transistors, said first series circuit being connected between the emitter and the collector of one of said two transistors, and said first power source being connected across said second series circuit, the improvement which a diode is connected in series to the collector-emitter circuit of one of said two transistors which conducts in a first half of the scan period, with the same direction of current flow as that of said collector-emitter circuit, thereby to form a third series circuit, said first series circuit is connected in parallel with one of said third series circuit and the other output transistor which conducts in the latter half of the scan period, and a second power source for supplying a voltage higher than that of said first power source is connected through a switch means between the junction point of said two output transistors and the junction point of said other output transistor and said first power source, said switch means being closed during the retrace period and open during the scan period.

3,979,642

ELECTRONIC PROTECTIVE CIRCUIT

Pieter G. Cath, Cleveland, and Robert J. Erdman, Twinsburg, both of Ohio, assignors to Keithley Instruments, Inc., Hudson, Ohio

Division of Ser. No. 428,744, Dec. 27, 1973, Pat. No. 3,875,506. This application Sept. 20, 1974, Ser. No. 507,674
Int. Cl.² H02H 3/00
U.S. Cl. 317—16 13 Claims



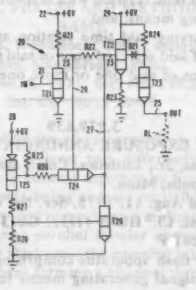
1. An electronic protective circuit for an electrical circuit including an amplifier having an input circuit and an output circuit, said output circuit being connected in a series circuit to an output terminal point, voltage limiting means for limiting the magnitude of the voltage across said input circuit of said amplifier to a given maximum voltage level when an overvoltage is applied to said terminal point, substantially all of said overvoltage being applied between said amplifier input circuit and said terminal point, and current limiting means interposed between said amplifier output and said terminal point for limiting the current flow through said series circuit to a given maximum current level and including semiconductor means having a first current path defined by two electrodes thereof connected in said series circuit between said amplifier output circuit and said terminal point and an impedance connected in said series circuit between said amplifier output circuit and said semiconductor means to thereby limit the current flow through said series circuit.

3,979,643

LOGIC DRIVER CIRCUIT WITH OUTPUT PROTECTION

Rafael Pelc, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 3, 1975, Ser. No. 546,486
Int. Cl.² H02H 7/20
U.S. Cl. 317—16 6 Claims



1. A driver for increasing the level of a logic signal, said driver comprising:

an input circuit responsive to a low-level input logic signal for producing drive current on a drive line;

an output circuit coupled to said drive line for producing a voltage indicative of said drive current;

a sensor transistor having a base and an emitter coupled across said resistor and adapted to conduct when said drive current exceeds a predetermined amount;

a control transistor coupled to said sensor transistor and to said drive line and adapted to conduct when said sensor transistor conducts, so as to shunt said drive current away from said output circuit for cutting off said output circuit when said drive current exceeds said predetermined amount; and

a latch transistor coupled to said sensor and to said control transistor but separate from said output circuit, for maintaining conduction of said contol transistor as long as said low-level input signal is present.

3,979,644

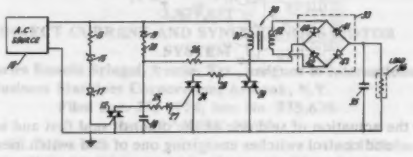
OVERVOLTAGE PROTECTION ARRANGEMENT

Norman Everhart, 74 Highspire Road, Richboro, Pa. 18954

Filed Jan. 23, 1975, Ser. No. 543,452

Int. Cl.² H02H 9/04

U.S. Cl. 317—20 **26 Claims**



1. In combination in overvoltage protective circuitry, first and second circuit points adapted for receiving an AC potential, a transformer having primary and secondary windings, a first terminal of said transformer primary winding connected to said first AC receiving circuit point, a bidirectionally conducting controlled switch for connecting a second terminal of said transformer primary winding to said second AC voltage receiving circuit point, a first capacitor and unidirectional conducting means serially connected between said AC receiving circuit points, means connecting said first capacitor to said bidirectionally conducting controlled switch for controlling said switch, overvoltage responsive controlled switching means connected in parallel with said capacitor, and voltage responsive threshold triggering means connected to the gate terminal of said overvoltage responsive switching means and one of said AC potential receiving circuit points.

3,979,645

PROTECTIVE CIRCUIT FOR SHORT-CIRCUIT AND OVERLOAD PROTECTION OF A POWER CIRCUIT

Ernst Wittenzellner, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

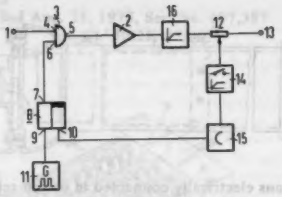
Filed Nov. 20, 1974, Ser. No. 525,556

Claims priority, application Germany, Dec. 5, 1973, 2360678

Int. Cl.² H02H 7/20

U.S. Cl. 317—33 R **6 Claims**

1. A circuit arrangement for short circuit and overload protection of a power circuit having a final stage, comprising an AND gate, the output of which forms the input of such final stage, with one input of said gate forming the input to the final stage, an overload sensor operatively connected to the output of the final stage, a bistable flip-flop circuit having an output connected to a second input of said AND gate, operative to control transmission from said first gate input to said stage input, in dependence upon said flip-flop, the latter having a pair of inputs, a pulse generator operatively connected to supply pulses to a first input of said flip-flop, and means responsive to predetermine results at said sensor operatively connected to the second input of said flip-flop circuit for triggering the same in the presence of an overload, or short circuit, whereby said input to the final stage is disconnected,



the pulse-interval ratio of said pulse generator being so determined that the net power loss in the event of a short circuit remains below a value damaging to said final stage.

3,979,646

SURGE VOLTAGE ARRESTER

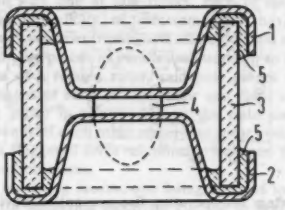
Gerhard Peche; Gerhard Lange, and Dieter Grueneberg, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 9, 1974, Ser. No. 513,349

Claims priority, application Germany, June 28, 1974, 2431236

Int. Cl.² H02H 3/22

U.S. Cl. 317—62 **12 Claims**



7. In a surge voltage arrester of the type having a gas-tight housing wherein a pair of discharge electrodes are arranged with their active electrode surfaces facing each other and spaced apart in a tubular insulating body, and at least one ignition electrode is carried by the insulating body over a portion of the length thereof, the improvement wherein:

the ignition electrode is carried on the inner surface of the insulating body and defines at least the envelope of a surface which has a normal that is perpendicular to the longitudinal axis of the surge voltage arrester, the width of the ignition electrode in the region of the active surfaces of the discharge electrodes being approximately equal to the widths of the active surfaces.

3,979,647

INDUCTIVELY COUPLED LOCK

Robert Richard Perron, Beverly, and John Thomas Fowler, Winchester, both of Mass., assignors to The Eastern Company, Naugatuck, Conn.

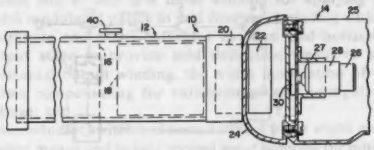
Filed June 11, 1975, Ser. No. 586,019

Int. Cl.² E05B 47/06

U.S. Cl. 317—134 **3 Claims**

1. An electronic lock system comprising, in combination: key means including generating means for generating a plurality of electrical signals, first inductor means electrically connected to said generating means; lock means including second inductor means positioned to inductively couple with said first inductor means when said key means is in predetermined spatial relation to said lock means, signal distinguishing means

electrically connected in circuit of said lock means and disposed to receive signals from said generating means, whereby a predetermined electrical signal is distinguished from said plurality of electrical signals from said generating means,



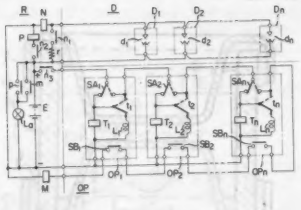
motor means electrically connected in driven relation to said signal distinguishing means, lock lug means connected in movable, driven relation to said motor means, whereby activation of said motor means causes movement of said lock lug means between a locked and unlocked position.

3,979,648

SYSTEM FOR OPERATING FIRE PREVENTION DEVICES

Shigeru Toyoshima, Nishinomiya; Mamoru Honda, Kashiwa; Katsuya Nakamura, Tokyo, and Katsuhisa Seki, Ohmiya, all of Japan, assignors to Nohmi Bosai Kogyo Co., Ltd., Tokyo, Japan

Filed Mar. 10, 1975, Ser. No. 556,713
Int. Cl.² H01H *47/14*
U.S. Cl. 317—139 **2 Claims**



1. A system for operating fire prevention devices comprising a plurality of fire prevention device operators each comprising an actuator coil adapted to be energized in response to the operation of a fire detector directly or through another operator that has already been operated, means for deenergizing said energized actuator coil and energizing an actuator coil in another operator upon the completion of the operation of said fire prevention device associated with said energized actuator coil, means for deenergizing said energized actuator coil and energizing the actuator coil in said other operator when said fire prevention device associated with said energized actuator coil fails to complete its operation within a predetermined time, and an indication device which intermittently operates in response to the operation of said fire detectors and which continuously operates when all of said fire prevention devices complete their operations, said indication device operable by means disposed in the respective fire prevention devices.

3,979,649

REMOTE SEARCHLIGHT CONTROL SYSTEM

Gerald C. Persha, 1912 W. 12 Mile Road, Royal Oak, Mich. 48073

Filed Aug. 9, 1974, Ser. No. 496,080
Int. Cl.² H02P *7/20*
U.S. Cl. 318—17 **10 Claims**

1. In an electric motor positioned lamp having at least two modes of operation, the improvement comprising:

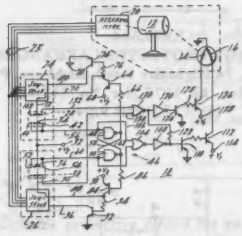
a control system for said lamp for controlling the aiming direction of the lamp including the azimuth and altitude of said lamp and at least two modes of operation from at least two space separated locations comprising first and second aiming direction control switches and first and second mode control switches,

circuit means interconnecting said control switches and said lamp for controlling the application of energy to said direction control switches and the lamps including means for disabling one of said first and second control switches upon the actuation of one or the other of said first and second control switches,

said interconnecting circuit means including a source of electrical energy,

means for applying said electrical energy to said direction control switches, and

first and second switch means connected between said source of power and each respective direction control switch,



the actuation of said one or the other of said first and second control switches energizing one of said switch means to apply said electrical energy to said other direction control switch and disable the other of said switch means to disconnect said electrical energy from said one direction switch,

said interconnecting circuit means further including bi-stable circuit means connected to said first and second mode control switches, and

mode output circuit means connected to said lamp for controlling the application of electrical energy to said lamp in one of two modes of operation,

said bi-stable circuit means enabling one of said output circuit means and disabling the other of said output circuit means in response to the actuation of said one of the other of said first and second control switches.

3,979,650

ENERGY CONVERSION APPARATUS FOR SUPPLYING VARIABLE VOLTAGE DIRECT CURRENT POWER TO AN ELECTRICALLY PROPELLED VEHICLE

Will B. Jamison, Bethel Park, and John F. Burr, Pittsburgh, both of Pa., assignors to Consolidation Coal Company, Pittsburgh, Pa.

Filed Dec. 4, 1974, Ser. No. 529,504
Int. Cl.² H02K *7/02*
U.S. Cl. 318—150 **8 Claims**

1. In an energy conversion apparatus for supplying variable voltage direct current power to an electrically powered vehicle having a flywheel mounted on the vehicle,

power means for supplying mechanical energy to said flywheel to be stored by said flywheel, and

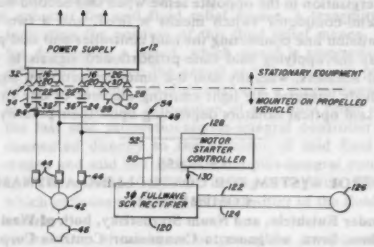
electrical generating means mounted on the vehicle and drivingly connected to said flywheel for transforming the stored mechanical energy of said flywheel to alternating current power,

the improvement comprising,

a direct current powered motor provided on the vehicle,

rectifying means connecting said electrical generating means to said motor for converting said alternating current power to direct current power to be supplied to said motor, and

controller means provided on the vehicle and connected to said rectifying means for controlling said rectifying means to supply direct current power to said motor at a preselected voltage, and



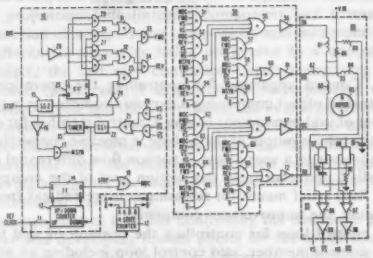
operator controllable means for actuating said controller means to control the voltage of the rectified current conducted from said rectifying means to said motor and thereby control the speed of said motor.

3,979,651

DIRECT CURRENT AND SYNCHRONOUS MOTOR SYSTEM

Charles Ronald Bringol, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,638
Int. Cl.² H02K *29/00*
U.S. Cl. 318—138 **14 Claims**



1. A motor control system for a motor having at least two stator windings angularly disposed about a rotor, comprising:

direct current means for generating position signals indicative of the position of said rotor relative to said windings;

a source of reference pulses having a frequency corresponding to a desired angular velocity of said rotor;

comparison means connected to said generating means and to said reference pulses for providing a first signal when the angular velocity of said rotor is equal to said desired angular velocity, and a second signal when the angular velocity of said rotor is less than said desired angular velocity;

logic means connected to said comparison means and to said generating means for driving said motor in a direct current mode by sequentially applying, in response to said second signal, direct current pulses to said stator windings according to the position of said rotor, said logic means driving said motor in a synchronous mode by sequentially driving, in response to said first signal, said windings with pulses of a predetermined duration at said frequency of said reference pulses; and

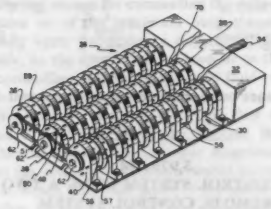
said comparison means and said logic means enabling repeated automatic transition from said direct current mode to said synchronous mode and from said synchronous mode to said direct current mode.

3,979,652

ELECTROMAGNETIC MOTOR UTILIZING ATTRACTION AND REPULSION FORCES

Charles E. Faxon, 1269 E. 1st. South No. 3, Salt Lake City, Utah 84102

Filed Aug. 25, 1975, Ser. No. 607,357
Int. Cl.² H02K *37/00*
U.S. Cl. 318—254 **5 Claims**



1. An electric motor for providing rotary drive power from a source of electrical power, comprising:

a plurality of rotatably mounted shafts;

gearing means for interconnecting said shafts together to drive an output shaft;

a plurality of rotors supported on each of said shafts, each of said rotors including a multiplicity of magnetic means polarly disposed parallel to the axes of rotation of said shafts;

a plurality of stators each fixed in stationary relationship in combination with one of said rotors, each of said stators including a multiplicity of electromagnets having pole pieces therein, said electromagnets affixed in said stators to dispose said pole pieces in parallel relationship to the magnetic means of a related rotor, said pole pieces and said magnetic means of each of said stator and rotor combinations being offset in relationship to the pole pieces and magnetic means of each other stator and rotor combination to provide a staggered drive relationship between the stator and rotor combinations;

a plurality of switching means, one being coupled to each of said shafts for supplying electrical current to said electromagnets in phase synchronization with the position of the rotors of each of said stator and rotor combinations whereby to propel said shafts;

means for keying the rotors supported by alternate shafts to said shafts so that said alternate shafts are driven by said rotors, the remaining rotors being free wheeling on their respective shafts; and

means for mechanically coupling adjacent shafts so that the said driven shafts drive adjacent shafts in the same direction.

3,979,653

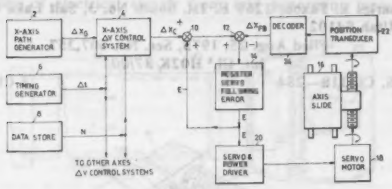
VELOCITY-CHANGE CONTROL SYSTEM AND METHOD FOR NUMERICAL CONTROL MACHINES

Hymie Cutler, 16230 Santa Rosa, Detroit, Mich. 48221

Filed Sept. 27, 1973, Ser. No. 401,293
Int. Cl.² G05B *19/24*
U.S. Cl. 318—571 **19 Claims**

1. Apparatus for moving a movable member in accordance with a programmed path and velocity, enabling the programming of rapid velocity changes, during both acceleration and deceleration, with reduced path errors, comprising: first digital generating means generating a series of program electrical pulses representing a first trace corresponding to the programmed path and velocity of movement of the movable member; second digital generating means generating, from said program electrical pulses, a series of command electrical pulses representing a second trace corresponding to the programmed path and velocity of the first trace but lagging same by a lag which varies with variations in the programmed path

velocity during both acceleration and deceleration; and drive control means controlling the movement of the movable member in accordance with said series of command electrical pulses.

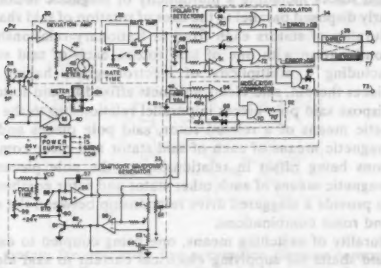


3,979,654

PROCESS CONTROL SYSTEM USING A TWO WIRE REMOTE CONTROL SYSTEM

Eugene H. Guicheteau, Audubon, and Justin O. Johnson, Jr., Levittown, both of Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 13, 1974, Ser. No. 469,339
Int. Cl.² G05B *11/28*
U.S. Cl. 318—599 **20 Claims**



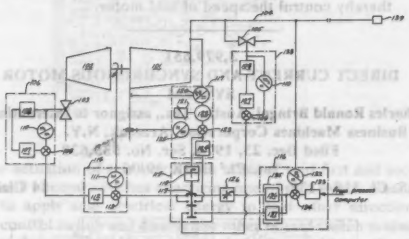
1. In a process control system having means to produce a signal that is variable in accordance with changes in a process and provided with a control means that is operative in a sense and to an extent for adjustment of said process to bring said process-variable signal into accord with a set point signal, the rate of said adjustment varying in accordance with the extent of deviation of said process variable and set point signals, a circuit comprising, a controller remote from said control means for comparing said process-variable and set point signals to produce at a pair of output terminals a d-c time-proportioned signal of one polarity when said process variable signal is less than said set point signal and of the opposite polarity when said process variable signal is greater than said set point signal, duration of said d-c signal being variable in accordance with the extent of deviation of said process-variable from set point signals, a power relay located adjacent said control means and operative selectively to control said control means for actuation to effect adjustment of said process in one direction or the other, said power relay having a pair of reversely connected optical isolators, each having a light emitting element and an individually associated light sensitive element adapted to be illuminated thereby when the associated light emitting element is energized, said control means including means responsive to the selective illumination of said light sensitive elements to produce a first trigger signal output in response to illumination of one of said light sensitive elements and a second trigger signal output in response to illumination of the other of the light sensitive elements, first and second semi-conductor switch means, means selectively to apply said first trigger signal to the gate of one of said semi-conductor switch means and the second trigger signal to the gate of the other semi-conductor switch means, means connecting said semi-conductor switch means and said control means to a source of electrical power for energization in a first sense when said first semi-conductor switch means is fired and for energization in the opposite sense when said second one of said semi-conductor switch means is fired, and a two-wire transmission line connecting the said controller and said power-relay for applying said time-proportioned signals to said optical isolators, whereby said d-c time-proportioned signals selectively energize the light emitting element of one or the other said optical isolators depending upon their polarity.

3,979,655

CONTROL SYSTEM FOR CONTROLLING A DYNAMIC COMPRESSOR

Alexander Rutshtein, and Naum Staroselsky, both of West Des Moines, Iowa, assignors to Compressor Controls Corporation, Des Moines, Iowa

Filed Mar. 31, 1975, Ser. No. 563,662
Int. Cl.² G05B *1/02*
U.S. Cl. 318—609 **1 Claim**



1. Control apparatus for controlling the operation of a controlled object comprising a dynamic compressor, a turbine driver of said compressor having a control member for changing the torque output of the turbine, a pipeline connecting said compressor to a user of gas, a suction flow differential device installed upstream from the suction port of the compressor, and fluid relief means for releasing compressed gas from said pipeline, the improvement comprising:

a control loop for controlling the position of said turbine control member, said control loop including an actuator for the turbine control member, a transmitter for indicating the position of said turbine control member, means for developing a signal responsive to a difference between the actual and the required position of said turbine control member and a proportional-plus-integral controller of the position for said turbine control member; said proportional-plus-integral controller being connected directly to said actuator, the proportional-plus-integral controller and the actuator together having a negative feedback which includes said position transmitter;

a speed control loop for controlling the speed of rotation of the compressor, said speed control loop developing the set point for the position loop of the turbine control member; said speed control loop including a speed transmitter, means for developing a signal responsive to the difference between the actual and the required speed, and a speed controller having a transfer function which represents the sum of the transfer function of a proportional-plus-integral component and the product of the transfer functions of an integral component and an aperiodic component; said speed controller being connected directly to the controlled object, said controlled object including the position loop of the turbine control member, the control member itself and the turbine; the output signal of said controlled object corresponding to the speed of rotation and both the speed controller and the

related controlled object together having a negative feedback which includes the speed transmitter;

a control loop for controlling the position of the fluid relief means which is connected to said pipeline; said position control loop including:

an actuator for said fluid relief means, a transmitter for indicating the position of this fluid relief means, means for developing a signal, which signal is responsive to a difference between the actual and the required position of said first fluid relief means, and a proportional-plus-integral controller of position of said fluid relief means, the last said proportional-plus-integral controller being connected directly to the actuator of said fluid relief means and said last proportional-plus-integral controller and the actuator together having a negative feedback which includes said position transmitter of the fluid relief means;

a control loop of minimum output of the compressor, this minimum output control loop limiting the minimum suction flow differential according to surge protection conditions and said minimum output control loop also developing the set point for the speed loop; said minimum output control loop including:

a transmitter emitting a signal corresponding to the pressure differential across the compressor, means for multiplying the pressure differential signal by a constant coefficient, and therefore developing a signal corresponding to the required minimum suction flow differential, said means for measuring the flow differential in the suction port, means for developing a signal responsive to a difference between the actual and the required flow differential in the suction port, and a minimum flow differential controller; the transfer function of said minimum flow differential controller being the product of a transfer function of a proportional-plus-integral component and a transfer function of an aperiodic component; said minimum flow differential controller being connected to a controlled object, the last said controlled object comprising the closed speed control loop with its corresponding controlled object and the compressor; the output signal of the minimum output control loop corresponding to the suction flow differential and the minimum flow differential controller and the related controlled object together having a negative feedback which includes a suction flow differential transmitter;

a pressure control loop for controlling the discharge pressure and developing the set points for the speed control loop and also for the control loop for controlling the position of the fluid relief means; said pressure control loop including a set point device, a transmitter of discharge pressure, means for developing a signal responsive to the difference between the actual and required discharge pressure, and a pressure controller; said pressure controller comprising two channels having a common input; the first channel developing the set point for the speed control loop, and the second channel developing the set point for the loop controlling position of said fluid relief means; said first channel being a proportional-plus-integral component; said first channel being connected to a controlled object, the last said controlled object comprising the speed control loop with its corresponding controlled object and the compressor; the output signal of said controlled object of the first channel of the pressure loop corresponding to the discharge pressure, and the first channel of the pressure controller and the related controlled object together having a negative feedback which includes a discharge pressure transmitter; the transfer function of said second channel representing the sum of the transfer function of a proportional-plus-integral component and the product of the transfer function of an integral component and an aperiodic component; said second channel being connected to a controlled object; said controlled object being related to the second channel comprising the control loop of the position of the fluid relief means, said fluid relief means itself, and the delivery network; the output signal of the respective controlled object of said second channel corresponding to the discharge pressure, and the second channel and the said controlled object together having a negative feedback which includes a discharge pressure transmitter;

nonlinear means for saturating the set point for the closed speed control loop, said set point being developed by the first channel of the discharge pressure controller;

a distributing means for connecting the output signals of the pressure or of the minimum output control loops, depending upon the pressure differential across the compressor, to the speed control loop or to the control loop for controlling the position of said fluid relief means;

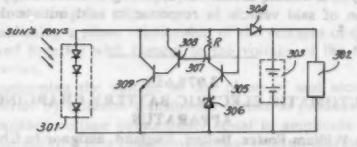
said distributive means connecting the input of the speed control loop to the output of the first channel of the pressure controller until the suction flow differential reaches its minimum admissible magnitude corresponding to the actual pressure differential across the compressor, at which time said input of the speed control loop is switches to the output of the minimum output control loop, and the output of the second channel of the pressure controller is connected to the control loop for controlling the position of said fluid relief means.

3,979,656

BATTERY CHARGING CIRCUIT

Shuji Takeda, and Tsutomu Otake, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 26, 1974, Ser. No. 536,714
Claims priority, application Japan, Dec. 25, 1973, 49-4004
Int. Cl.[2] H02J *7/00*; **G04C** *3/00*
U.S. Cl. 320—2 **5 Claims**



1. In a battery charging circuit having a solar energy source series-coupled to a secondary battery for applying a charging current thereto, the improvement comprising voltage detecting means coupled in parallel with said battery for detecting the state of charge of same, said detecting means including a constant voltage element and a detecting transistor including a control electrode referenced to said secondary battery potential for detecting the state thereof, and first and second current path electrodes coupled in series with said constant voltage element, and by-pass means including a first control electrode coupled to the detecting means and second and third current path electrodes connected in parallel with said battery for defining a by-pass current path for said charging current applied to said battery to prevent same from being overcharged, said by-pass means in response to the state of charge of said battery as detected at said first control electrode from said voltage detecting means, preventing the conduction of current in the current path defined by the second and third electrodes until said battery is charged to a predetermined voltage determined by the constant voltage element and thereafter permitting conduction of current in the current path defined by said by-pass means second and third electrodes, whereby the battery is by-passed when fully charged.

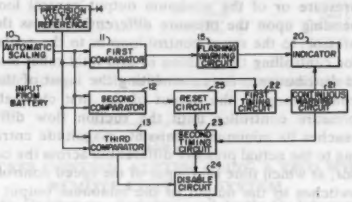
3,979,657
BATTERY MONITOR WITH AUTOMATIC SCALE AND RECYCLE PREVENTS

Daniel S. Yorksie, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 360,698, May 15, 1973, abandoned. This application Aug. 22, 1975, Ser. No. 607,010

Int. Cl.² H01M *10/48*

U.S. Cl. 320—13 **9 Claims**



1. A circuit for monitoring the terminal voltage of an electrical energy source for an electrically powered vehicle, comprising in combination: (a) automatic scaling means for monitoring the terminal voltage of said energy source and adjusting an attenuator to a range appropriate for the energy source being monitored to produce a first signal, said first signal having a predetermined relationship to the terminal voltage of said energy source, said scaling means also including a filter to assure that said range changing means does not respond to rapid changes in the terminal voltage of said energy source; (b) comparator and timing means for comparing the magnitude of said first signal to a reference signal to determine if said first signal decreases below a first predetermined level and remains below a second predetermined level for a predetermined time interval to generate and initiate disable signal; and (c) first disable means for disabling a selected operative function of said vehicle in response to said initiate disable signal.

3,979,658
AUTOMATIC ELECTRIC BATTERY CHARGING APPARATUS

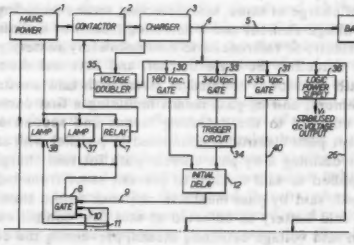
George William Foster, Bolton, England, assignor to Chloride Group Limited, London, England

Filed Feb. 25, 1975, Ser. No. 552,759

Claims priority, application United Kingdom, Feb. 26, 1974, 8591/74

Int. Cl.² H02J *7/04*

U.S. Cl. 320—23 **18 Claims**



1. Automatic electric battery charging apparatus of the taper charge type for supplying a direct charging current to battery terminals from a.c. supply terminals, comprising: means for generating a control signal representative of the difference between a first signal dependent on the battery voltage and a second signal dependent on the a.c. supply voltage; and terminating means responsive to the rate of rise of said control signal for initiating the termination of a phase of the charge when the rate of rise of said control signal falls below a predetermined value.

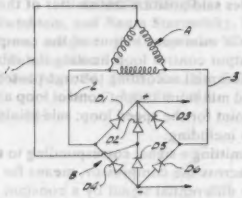
3,979,659
AUTOMOTIVE ALTERNATOR RECTIFIER BRIDGES

Peter F. Lynch, Jr., Attleboro; Richard G. Delagi, Sharon, both of Mass., and Richard E. Haley, Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 30, 1975, Ser. No. 545,644

Int. Cl.² H02M *7/155*

U.S. Cl. 321—8 R **9 Claims**



1. An automotive alternator rectifier bridge comprising a pair of generally flat heat-conducting laminated bases each having a central layer of aluminum with layers of copper bonded to the opposite surfaces thereof, a plurality of first diodes each having its cathode solder-connected to one surface of one of the bases, a plurality of second diodes each having its anode solder-connected to one surface of the other of said bases, each of said diodes being constituted by a discrete semiconductor chip having a metallic layer in ohmic contact with one face thereof and each diode being secured to one of said bases by having its metallic layer soldered to the laminated base and electrical conductors solder-connected to the anodes of the first diodes and to the cathodes of said second diodes and extending generally parallel to the bases for connection to automotive alternator terminals.

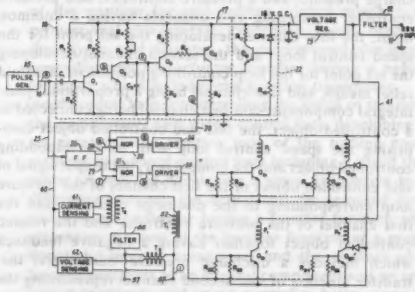
3,979,660
START-UP CIRCUIT FOR STATIC INVERTER

Thomas W. Moore, Dayton, Ohio, assignor to AMF Incorporated, White Plains, N.Y.

Filed July 25, 1975, Ser. No. 599,148

Int. Cl.³ H02M *1/18*

U.S. Cl. 321—11 **12 Claims**



9. In a static inverter having switching devices which are selectively operable in response to control pulses to produce an a.c. output, improved means for limiting the duration of said control pulses on initial application of a source of supply to the inverter, comprising

pulse generating for generating pulses at a predetermined rate,

monostable circuit means responsive to said pulses for producing output control pulses at said predetermined rate,

said monostable circuit including

a charging circuit,

means coupling said charging circuit to said pulse generating means for discharging said charging circuit upon occurrence of each pulse,

said charging circuit charging up to at least a given potential in the periods between discharges,

a controllable conduction semiconductor device having a control electrode and second and third electrodes,

said control electrode being coupled to said charging circuit,

a second controllable conduction semiconductor device connected in emitter follower circuit configuration between the conductors of said supply source,

the second electrodes of the two devices being connected in parallel and the third electrodes of said devices being coupled to the supply source,

means including means coupled to the control electrode of the second device for maintaining the second device nonconductive until a predetermined time after the first pulse output of said pulse generating means,

said last named means providing subsequently to the predetermined time after said first pulse output a bias for producing current flow in the emitter follower conduction device that biases the second electrode of the first conduction device to cause conduction of the second device only when the charging circuit is charged to at least said given potential.

3,979,661

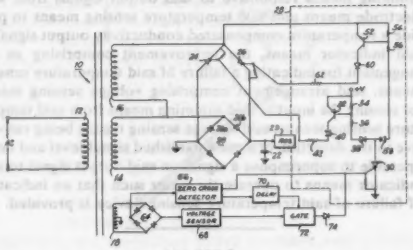
POWER SUPPLY APPARATUS HAVING AN OUTPUT VOLTAGE WITHIN A LIMITED RANGE REGARDLESS OF INPUT VOLTAGE VARIATIONS AND HAVING MINIMAL POWER DISSIPATION

Bjorn J. Matz, Forest Hills, N.Y., assignor to Dictaphone Corporation, Rye, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,455

Int. Cl.² H02P *13/24*; **G05F** *5/00*

U.S. Cl. 321—18 **8 Claims**



1. Power supply apparatus for supplying a substantially constant regulated voltage regardless of the variations of an input AC supply voltage, with minimal power dissipation, comprising:

a transformer having a primary winding for receiving said input AC supply voltage and plural secondary windings;

input voltage detecting means for detecting the amplitude of said input AC supply voltage and for producing a control signal as a function thereof;

rectifier means connected to one of said secondary windings for rectifying the voltage produced by said one secondary winding;

switch means connected to the remaining secondary windings for selectively connecting said remaining secondary windings in series with said one secondary winding to correspondingly change the level of said rectified voltage;

switch control means coupled to said switch means and responsive to said control signal for selectively actuating said switch means when the amplitude of said input AC supply voltage crosses a threshold level; and

voltage regulating means supplied with said rectified voltage for producing a regulated voltage proportional thereto.

3,979,662

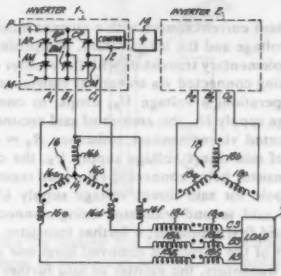
PARALLELING OF INVERTERS FOR LOW HARMONICS

Frank N. Klein, Kenosha, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 5, 1975, Ser. No. 574,771

Int. Cl.² H02M *7/515*

U.S. Cl. 321—27 MS **18 Claims**



1. A method for connecting first and second switchingtype three-phase inverters to supply electrical power to a common load comprising the steps of:

establishing a phase relationship of the voltages of the second inverter with respect to the voltage of the first inverter,

transforming the voltage of one phase of said second inverter by isolation transformer means to produce a first isolated voltage substantially equal in amplitude to the voltage of a first phase of said first inverter and differing in phase therefrom by a first predetermined angle less than 90°,

transforming the voltage of at least one phase voltage selected from the other two phases of said second inverter by isolation transformer means to produce at least a second isolated voltage smaller in amplitude than said voltage of said first phase of said first inverter and differing in phase from said first isolated voltage by a second predetermined angle,

transforming the voltage of at least one phase voltage selected from the other two phases of said first inverter by isolation transformer means to produce at least a third isolated voltage substantially equal in amplitude to said second isolated voltage and differing in phase from said first phase voltage of said first inverter by said second predetermined angle but in an opposite sense of leading or lagging than the sense with which said second isolated voltage differs from said first isolated voltage,

producing a voltage for driving one phase of said common load by connecting together in series circuit arrangement said first phase voltage of said first inverter, said first isolated voltage, at least said second isolated voltage, and at least said third isolated voltage, and

repeating the foregoing steps symmetrically for the other two phases to provide three-phase electrical power for said common load.

3,979,663

CONSTANT CURRENT SOURCE

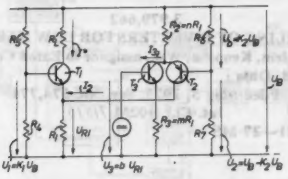
Dieter Herchner, Heilbronn, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Jan. 29, 1975, Ser. No. 545,294

Claims priority, application Germany, Feb. 23, 1974, 2408755

Int. Cl.² G05F 1/56

U.S. Cl. 323—4 7 Claims



1. A constant current source with a current independent of the supply voltage and the temperature, comprising: first and second complementary transistors with the emitter of said first transistor being connected via an emitter resistance R_1, across which, in operation, a voltage U_{R1} drops, to one pole of a direct voltage supply U_B, the emitter of said second transistor being connected via an emitter resistance $R_2 = nR_1$ to the other pole of said direct voltage supply U_B, the collector of said first transistor being connected via a load resistance R_L to said other pole for said direct voltage supply U_B, and the collector of said second transistor being connected to the emitter of said first transistor; a further transistor T_3 through which a part of the current is removed from one of said first and second transistors, the emitter of said further transistion being connected via an emitter resistance $R_3 = mR_1$ to a terminal of said direct voltage supply, and the collector of said further transistor being connected to one of the emitters and collectors of said first and second transistors; and means for applying in operation the following direct voltages with assigned indices

$$U_1 = K_1 U_B,\ U_3 = U_B - K_2 U_B,\ U_5 = bU_{R1},$$

to the bases of said first, said second and said further transistors respectively; and wherein the circuit is so dimensioned that the following interrelationships between the constants k_1, k_2, n, m, b apply:

$$K_2 = nK_1,\ 1/n = 1+1/b,\ m=b,$$

whereby a voltage and temperature independent collector current I^* for said first transistor is achieved.

3,979,664

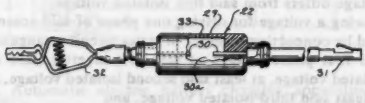
CAPACITOR DISCHARGE IGNITION TESTING APPARATUS EMPLOYING VISUAL SPARK GAP INDICATOR

Mark Harris, Brownsville, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Division of Ser. No. 346,158, March 29, 1973, Pat. No. 3,891,917. This application Mar. 3, 1975, Ser. No. 554,747

Int. Cl.² G05F 1/16

U.S. Cl. 324—17 4 Claims



1. A spark gap unit for an ignition testing apparatus providing on site testing of capacitor discharge ignition systems for internal combustion engines comprising a pair of spark gap electrodes mounted in spaced relation and having input power connection means, an enclosing housing enclosing the ends of the electrodes and the gap therebetween, said housing providing an essentially fluid tight enclosure, said housing including a small passageway means permitting a restricted fluid interchange between the inside and outside of the housing and restricting the propagation of a spark from between the electrodes outwardly of the housing while permitting the escape of gases from within the housing.

3,979,665

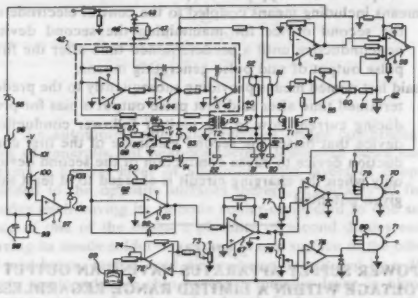
CONDUCTIVITY MONITORING SYSTEM

Wendell V. Ebling, Libertyville, Ill.; Herbert Goldsmith, Rockville, and Rodolfo R. Rodriquez, Columbia, both of Md., assignors to Baxter Laboratories, Inc., Deerfield, Ill.

Filed Feb. 5, 1975, Ser. No. 547,319

Int. Cl.² G01N 27/42

U.S. Cl. 324—30 R 2 Claims



1. In a conductivity monitoring system for monitoring the conductivity of a fluid flowing into and through a conductivity cell including electrode means within the conductivity cell for providing an output signal representative of the conductivity of said fluid, temperature sensing means disposed within said conductivity cell for providing an output signal representative of the temperature of said fluid flowing into and through said conductivity cell, indicator means, coupling means including summing means responsive to said output signals from said electrode means and said temperature sensing means to provide a temperature compensated conductivity output signal to said indicator means, the improvement comprising an arrangement for indicating a failure of said temperature sensing means, said arrangement comprising voltage sensing means for sensing the input to said summing means from said temperature sensing means, said voltage sensing means being responsive to the detection of a pre-established signal level and being operable to superimpose a signal on said output signal to said indicator means to operate the latter such that an indication of failure of said temperature sensing device is provided.

3,979,666

METHOD AND APPARATUS FOR EVALUATING PROPERTIES OF CARBON FIBERS USING CAPACITANCE SENSING

Alexander F. MacLean, Durham, N.H., and Ilmar L. Kalniv, Millington, N.J., assignors to Celanese Corporation, New York, N.Y.

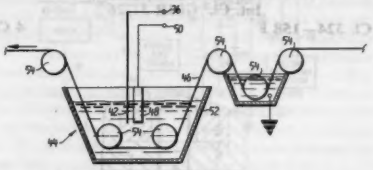
Division of Ser. No. 326,711, Jan. 26, 1973, Pat. No. 3,864,626. This application Oct. 1, 1974, Ser. No. 511,008

Int. Cl.² G01R 27/26

U.S. Cl. 324—61 R 20 Claims

1. A method for controlling the manufacturing process of a carbonaceous fibrous material containing at least about 90 percent carbon by weight comprising the steps of:

a. providing an electrolyte and a counter electrode in contact with the electrolyte;
b. disposing the carbonaceous fibrous material being manufactured in contact with the electrolyte at a predetermined distance from the counter electrode;
c. applying an electrical potential of known amplitude between the counter electrode and the carbonaceous fi-



brous material through a reference capacitor having a known value;
d. sensing the amplitude of an output potential across the reference capacitor;
e. evaluating a physical property of the carbonaceous fibrous material as a function of the sensed amplitude; and,
f. controlling a process condition in response to the evaluation.

3,979,667

ELECTRICAL INDICATORS

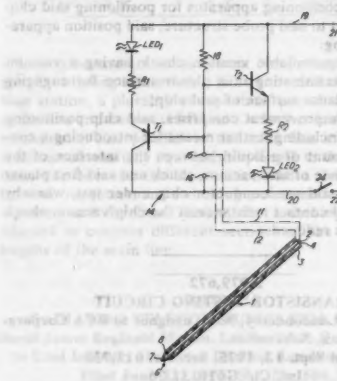
Nigel W. Cornes, Hatfield, England, assignor to Diplex Limited, England

Filed Dec. 13, 1974, Ser. No. 532,672

Claims priority, application United Kingdom, Jan. 2, 1974, 156/74

Int. Cl.² G01R 27/20

U.S. Cl. 324—65 R **2 Claims**



1. In a domestic soil-moisture indicator including a probe comprising a pair of insulated electrodes, said electrodes having spaced ends for insertion in soil whose moisture content is to be measured, whereby said soil constitutes a variable resistance between said electrodes, the improvement which comprises a control circuit including a source of electric power, a fixed resistor connected in series with said variable resistance to constitute a voltage divider across said source of supply, said voltage divider having a division point, a pair of light-emitting devices, a complementary pair of emitter-following transistors, said transistors each being connected in series with a respective light-emitting device in opposite senses across said source of supply and connections to said transistors from said division point of said voltage divider, whereby the total illumination emitted by said light-emitting devices is controlled to be substantially constant and, at one end of the scale of values of said variable resistance, one of said devices is fully on and the other said device is off, while at the other end of the scale said one device is off and said other device is fully on, the brightness of said two devices varying between these extremes for intermediate values.

3,979,668

DEVICE FOR TESTING ANY LEAKAGE OF VACUUM-TIGHT GLASS SEALS

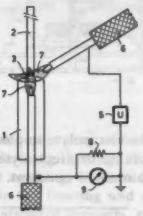
Helmut Samulowitz, Verlautenheide, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 17, 1974, Ser. No. 489,372

Claims priority, application Germany, July 27, 1973, 2338192

Int. Cl.² G01N 27/70

U.S. Cl. 324—71 R **1 Claim**



1. A device for testing any leakage of vacuum-tight glass seals by means of electrodes which are connected to a high voltage source, said electrodes being arranged on either side of the glass seal, which electrodes produce an electric breakdown through the glass seal in the case of leakage wherein at least one of the high voltage electrodes is a burner and a jet of burning gas from said burner, said burner being connected to said high voltage source wherein said seal is between an open lamp envelope and an exhaust tube and wherein an outer electrode and an inner electrode are burning jets of gas.

3,979,669

PARTICLE ANALYZING SYSTEM

Thomas J. Godin, West Hollywood, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

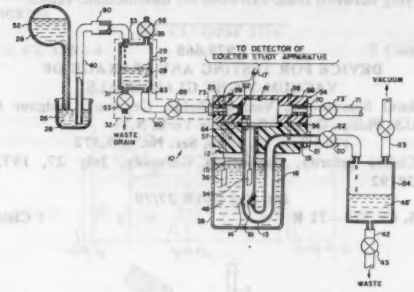
Continuation-in-part of Ser. No. 400,986, Sept. 26, 1973, Pat. No. 3,902,115. This application June 24, 1975, Ser. No. 589,936

Int. Cl.² G01N 27/00

U.S. Cl. 324—71 CP **17 Claims**

1. A particle-free electrolyte supply system for particle measuring apparatus in which an aperture retaining member is provided in a vessel for containing a body of particulate liquid suspension to be analyzed, the member having an aperture to permit passage of the suspension from the vessel into the member, the apparatus including a first electrode in the vessel and a second electrode in the member to establish an electrical field in the aperture between the vessel and the member, means including electrical leads connected to the electrodes and adapted to extend connections to a detector to respond to electrical measuring signals produced across the electrodes with passage of particles through said aperture, the member having an inlet chamber for introduction of particle free electrolyte, an outlet chamber in fluid communication with the inlet chamber, an electrolyte isolator and first conduit for fluid communication between the isolator and inlet chamber, an electrolyte supply and second conduit for fluid communication between the supply and isolator, a waste container in fluid communication with the outlet chamber, and fluid moving means connected to the waste container, said system

comprising, a first restriction in the first conduit and a second restriction in the second conduit, whereby the fluid moving



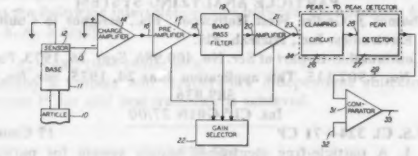
means will cause the electrolyte to pass from the supply to the isolator but the volume of electrolyte in the isolator will be established and maintained constant.

3,979,670

APPARATUS FOR DETECTING AND MEASURING PEAK-TO-PEAK VALUES IN ELECTRICAL SIGNALS

Sotirios John Vahaviolos, East Windsor Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 389,414, Aug. 17, 1973, Pat. No. 3,924,456. This application Jan. 29, 1975, Ser. No. 545,068
Int. Cl.² G01R *19/16*
U.S. Cl. 324—103 P **9 Claims**



1. Apparatus for detecting and measuring peak-to-peak values in an electrical input signal comprising a group of positive-going peaks and a group of negative-going peaks, the apparatus comprising:

a clamping circuit for referencing one of said group of peaks to a predetermined d.c. voltage level, comprising:

an operational amplifier having an inverting input for receiving the input signal, a non-inverting input, and an output terminal; and

a first network, connected to said inverting input, to reference one of the groups of peaks of the input signal to said predetermined d.c. voltage; and

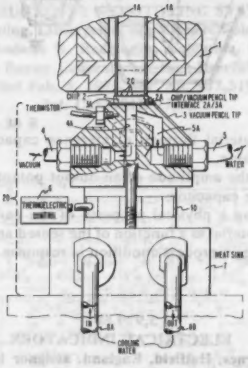
a peak detecting and measuring circuit connected to said clamping circuit for providing an electrical output signal indicative of the magnitude of the other unreferenced peaks with respect to said predetermined d.c. voltage level.

3,979,671

TEST FIXTURE FOR USE IN A HIGH SPEED ELECTRONIC SEMICONDUCTOR CHIP TEST SYSTEM

Robert G. Meeker, Wappingers Falls; William J. Scanlon, Hopewell Junction, and Zvi Segal, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 6, 1975, Ser. No. 555,766
Int. Cl.² G01R *31/26*
U.S. Cl. 324—158 F **4 Claims**



1. In a high speed electronic system for testing monolithic semiconductor chips fabricated by large scale integration techniques, wherein said semiconductor chips have a first substantially planar surface and a second substantially planar surface containing an array of conductive pads thereon,

a probe structure for contacting said conductive pads on said chip, positioning apparatus for positioning said chip with respect to said probe structure, said position apparatus including:

a precision controllable vacuum chuck having a vacuum pencil tip terminating in a planar surface for engaging said first planar surface of said chip;

wherein the improvement comprises, said chip positioning apparatus including further means for introducing a controlled amount of a liquid between the interface of the planar surface of said vacuum chuck and said first planar surface of said semiconductor chip under test, whereby the thermal contact resistance at the chip/vacuum chuck interface is reduced.

3,979,672

TRANSISTOR TESTING CIRCUIT

Hugh Arnoldi, Londonderry, N.H., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 12, 1975, Ser. No. 612,738
Int. Cl.² G01R *31/26*
U.S. Cl. 324—158 T **12 Claims**

1. A test circuit for a bipolar transistor, said transistor having collector and emitter electrodes defining a conduction path therebetween and a control electrode comprising, in combination:

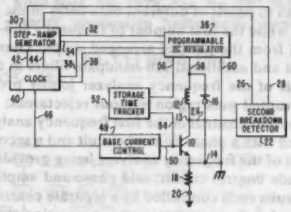
energy storage means connected in series with said path to form a series circuit;

means for applying successively larger currents to said series circuit;

means for applying a forward bias to said control electrode while applying said successively larger currents;

means, after each application of a current to said series circuit, for concurrently interrupting the flow of said current and changing the bias applied to said control electrode from a forward to a reverse bias;

means responsive to the voltage across said energy storage means when said current is interrupted for providing a low impedance path across said series circuit in a direction to permit current flow from said energy storage



means through said conduction path and said low impedance path back to said energy storage means; and

means for indicating a rapid decrease in the voltage between the collector and emitter electrodes of said transistor while said reverse bias is present.

3,979,673

RADIATING TELECOMMUNICATION SYSTEMS SWITCHING

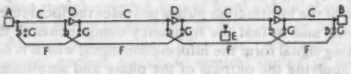
David James Reginald Martin, Leatherhead, England, assignor to Coal Industry (Patents) Limited, London, England

Filed June 12, 1975, Ser. No. 586,245

Claims priority, application United Kingdom, Aug. 7, 1974, 34806/74

Int. Cl.² H04B 7/26

U.S. Cl. 325—2 **8 Claims**



1. A telecommunication system comprising a base station, a main radiating transmission line connected at one end to the base station, a plurality of repeaters spaced along the length of the line and connected thereto, a further length of radiating transmission line parallel to the main line and divided into sections substantially equivalent in length to the lengths of the main line between the base station and a first repeater and between repeaters, and switching means associated with each repeater and the base station; the switching means being adapted to connect different sections of the further line to lengths of the main line.

3,979,674

RADIATING TELECOMMUNICATION SYSTEMS

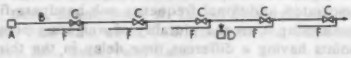
David James Reginald Martin, Leatherhead, England, assignor to Coal Industry (Patents) Limited, London, England

Filed June 12, 1975, Ser. No. 586,280

Claims priority, application United Kingdom, Aug. 7, 1974, 34805/74

Int. Cl.² H04B 7/26

U.S. Cl. 325—4 **10 Claims**



1. A telecommunication system including a base station and a mobile station, a radiating transmission line having at least one repeater along its length, and the base station being arranged through the line to transmit signals to and to receive signals from the mobile station, and a further length of radiating transmission line connected to the said radiating transmission line adjacent the repeater on one side thereof and extending substantially in parallel with the said radiating transmission line on the other side of the repeater.

3,979,675

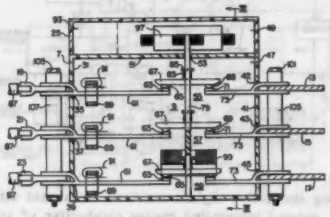
CIRCUIT INTERRUPTER

Alfred E. Maier, Beaver Falls, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 7, 1975, Ser. No. 565,500

Int. Cl.² H01H 77/10

U.S. Cl. 335—16 **6 Claims**



1. A circuit interrupter comprising a circuit breaker and an electrically insulating housing having an access opening therein, a cover for the opening, at least two sets of circuit breaker structures within the housing and comprising sets of pairs of movable and stationary contacts, means for opening and closing the contacts and comprising a crossbar for each pair of movable contacts and a connecting element, the sets of contacts being disposed in a stacked arrangement, the crossbars being mounted on the connecting element in spaced positions, the movable contacts being mounted on the crossbars, the connecting element being operable to move the crossbars simultaneously between open and closed positions, a first conductor leading to one of each pair of stationary contacts, a second conductor leading to the other of each pair of stationary contacts, the first conductors being in stacked spaced relation and extending through the housing, the second conductors being in stacked spaced relation and extending through the housing, and means responsive to a current overload for moving the connecting element to the open position and comprising a slot motor including a body of laminated sheets of magnetic material having a slot in which one crossbar is disposed for generating a magnetic flux in the body which flux is sufficient to lift the cross bar along the slot so as to move the movable contacts to the open position.

3,979,676

DELTA MODULATION APPARATUS

Mario Poma, Guelph, Canada, assignor to International Standard Electric Corporation, New York, N.Y.

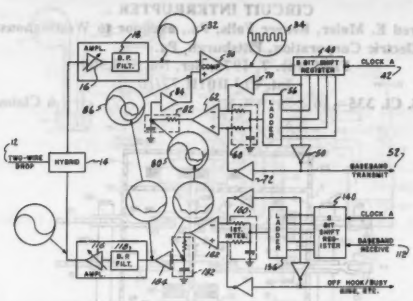
Filed Oct. 21, 1974, Ser. No. 516,252

Int. Cl.² H04B 1/00

U.S. Cl. 325—38 B **3 Claims**

1. A continuously variable sloped delta modulator for voice frequency signals comprising: a source of analog input signals within the voice frequency range, said modulator including a comparator for producing binary signals derived from said analog input signals, means coupling said source to one input of said comparator, a network for reconstructing an analog based on said binary signals, and a feedback path between said network and a second input to said comparator for comparison with said analog input signal to produce a modulator output signal, said reconstructing network including, a multiple bit shift register for storing successive binary signals received from said comparator, a first output from said register indicative of the binary signal most recently received by said register from said comparator, an output signal path from said

modulator for transmitting an output indicative of said most recently received binary signal, a multiple input ladder attenuator network receptive of successive signals in parallel clocked from said shift register, said attenuator network operative to sum and weight signals received from said register and for delivering successive signals for feedback, first means for



integrating successive signals received from said attenuator network, second integrating means productive of an amplitude envelope signal based on the slope of the signal received from the first integrating means, and a first and a second bypass path coupling said register first output path into said feedback path bypassing said attenuator network.

3,979,677

SYSTEM FOR AUTOMATIC EQUALIZATION

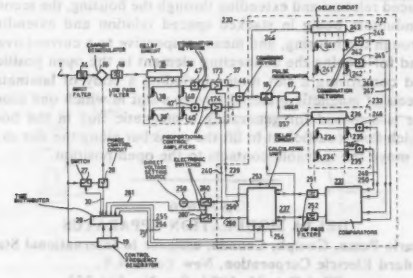
Felix Bagdasarjanz, Winterthur, Switzerland, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 3, 1975, Ser. No. 564,657

Claims priority, application Netherlands, Apr. 25, 1974, 7405553

Int. Cl.² H04B 1/00

U.S. Cl. 325—42 **11 Claims**



1. System for equalizing the transfer characteristic of a transmission band associated with a transmission path and allotted to the transmission of information signals, which characteristic is constituted by an amplitude-frequency characteristic and a phase-frequency characteristic, which system is arranged for the transmission of information pulses, the system comprising:

a. a first frequency analyzer connected to the transmission path for splitting up the transmission band into a first number of frequency sub-bands, the first frequency analyzer comprising a first delay circuit receiving said information signals from said transmission path and a plurality of parallel arranged output channels connected to said first delay circuit, each of the output channels incorporating a first sub-bandpass filter and a first additional sub-bandpass filter, said first sub-bandpass and first additional sub-bandpass filters having the same pass band but a constant mutual phase shift at least over the pass band of said filters, the first sub-bandpass and additional sub-bandpass filters being constituted by connecting each of the output channels through a first plurality of weighting networks to points of different time delay in the first delay circuit, while the first number of frequency sub-bands are derived from the parallel arranged output channels;

b. the first and additional sub-bandpass filters in the output channels of the frequency analyzer jointly providing an uninterrupted pass region without rejectareas;

c. a first output channel of the first frequency analyzer being provided with a phase control circuit and a second output channel of the frequency analyzer being provided with an amplitude control circuit, said phase and amplitude control circuits each controlled by a separate control voltage;

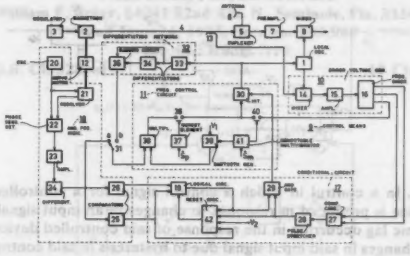
d. a control voltage generator for generating the separate control voltages for controlling the phase and amplitude control circuits incorporated in the output channels of the first frequency analyzer, which control voltage generator comprises a plurality of comparators fed by frequency components of at least one spectrum component of an incoming adjusting signal which is split up into its frequency components in the first frequency analyzer, the generator further comprising a local reference source for the phase and amplitude reference of the adjusting signal split up into its frequency components, the control voltages for the different phase and amplitude control circuits being derived from the outputs of the comparators;

e. a system output circuit comprising a combination device connected to the phase and amplitude control circuits in the output channels and a succeeding pulse regenerator connected to an output of said combination device, the system for equalizing the transfer characteristic of a transmission band being characterized in that in the control voltage generator the local reference source is constituted by the pulse regenerator which by pulse regeneration of the information pulses provides the local reference signal, and in that the frequency components of the adjusting signal form the information signal which is derived by applying the outputs of the phase and amplitude control circuits to the combination device, bypassing the pulse regenerator, and for generating the control voltages for the phase and amplitude control circuits the different comparators in the control voltage generator have applied to them a second frequency sub-band and a second associated additional frequency sub-band of the adjusting signal, a first frequency selective means connected to said combining device including a second delay circuit for providing said second frequency sub-band and second associated additional frequency sub-band, a third frequency sub-band and a third associated additional frequency sub-band of the local reference signal being applied to the comparators in the control voltage generator, said third frequency sub-band and third associated additional frequency sub-band being in the same frequency range as said second frequency sub-band and second associated additional frequency sub-band, second frequency selective means connected to said combining device and including a third delay circuit having the same time delay as said second delay circuit for providing said third frequency sub-band and third associated additional frequency sub-band, said second frequency selective means being arranged as a second frequency analyzer having second frequency sub-bandpass filters and second associated additional frequency sub-bandpass filters by connecting a second plurality of weighting networks to points having a different time delay in the third delay circuit, the output circuits of the comparators each are connected to said phase and amplitude control circuits through mean-value devices for feedback control of the phase and amplitude control circuits in the equalizing system.

3,979,678
PULSE RADAR APPARATUS

Bernhardus Walter Antonius Burgers, and Wilhelmus Antonius Teulings, both of Hanksbergen, Netherlands, assignors to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Sept. 18, 1974, Ser. No. 507,365
Claims priority, application Netherlands, Sept. 21, 1973, 7313021
Int. Cl.² H04B 1/04
U.S. Cl. 325—184 8 Claims



1. Pulse radar apparatus comprising: a tunable local oscillator; a servomotor; a continuously tunable transmitting device controlled by said servomotor to generate and transmit r.f. pulse signals at a momentary frequecy f_s in a sequence of defined interpulse periods; control means to fine tune said local oscillator operating at a momentary frequency f_l to a frequency f_{lo} which is mixed with the momentary transmitter frequency f_s to produce a difference frequency f_o, fixed in sign and magnitude, said control means including an error voltage generating means coupled to said local oscillator and to said transmitting device to generate an error voltage proportional to the frequency difference $\Delta f = f_s$ where $\Delta f = (f_s - f_l)$, a frequency control circuit to control tuning of said local oscillator, and means for producing a setting voltage corresponding to the momentary change of the transmitter frequency

$$\frac{df_s}{dt};$$

switching means operable to apply said setting voltage and said error voltage to said frequency control circuit; an angular position indicator coupled to the rotor of said servomotor; a conditional circuit which in response to the output from said position indicator delivers a switching signal to said switching means during a period when the transmitting device is operative in a frequency range $(f_l + f_o)$, to adjust said frequency control circuit during a first time interval T_1 at the end of each interpulse period to the setting voltage and, during a second time interval T_2 at the beginning of each interpulse period, to said error voltage.

3,979,679
FM DEMODULATOR HAVING SQUELCH CIRCUIT USING BUCKET BRIGADE DELAY LINE

John A. Bush, Sunol; Drew R. Lance, Saratoga, and John E. Altstatt, Palo Alto, all of Calif., assignors to California Microwave, Inc., Sunnyvale, Calif.

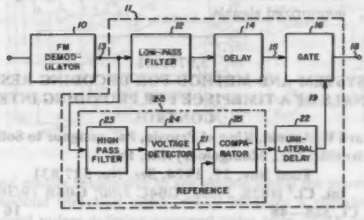
Filed June 30, 1975, Ser. No. 591,533
Int. Cl.² H04B 1/10
U.S. Cl. 325—348 8 Claims

1. In an FM-receiver including a demodulator for demodulating audio signals from a frequency-modulated carrier transmission and a squelch circuit for coupling the demodulated audio signals to a receiver output terminal, an improved squelch circuit comprising:

first filter means coupled to the output of the demodulator and having a first pass band for passing the demodulated audio signals and for rejecting noise signals having frequencies outside of said first pass band;

first delay means for delaying the filtered audio signals for a first predetermined period of time;

noise detector means coupled to the output of the demodulator for distinguishing between the noise level of said noise signals when a transmission is being received and



the noise level of said noise signals when no transmission is being received, and for developing a control signal when a transmission is being received, said control signal being a binary signal having a leading edge and a trailing edge;

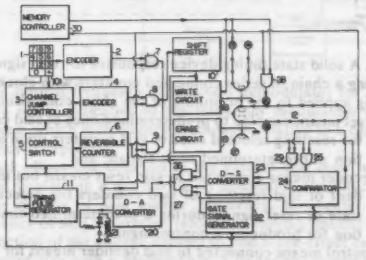
second delay means for delaying the leading edge of said control signal for a second predetermined period of time, said second period of time being less than said first period of time; and

gate means for coupling said filtered audio signals to the receiver output terminal in response to the delayed control signal.

3,979,680
CHANNEL SELECTOR

Yoichi Sakamoto, Takatsuki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 15, 1973, Ser. No. 416,118
Int. Cl.² H04B 1/26
U.S. Cl. 325—464 10 Claims



1. In a channel selector having a tuning circuit employing a variable reactance element,

memorization means comprising:

first means for producing first coded signals representing channel numbers corresponding to said channels respectively,

second means for producing second coded signals representing voltages respectively corresponding to said first coded signals, said second coded signals being coupled to the reactance element of said tuning circuit for tuning said circuit to a selected channel, and

means for including a non-volatile memory for permanently storing therein both first and second coded signals; and

channel selection means comprising:

read-out means coupled to said non-volatile memory for reading out from said memory a desired second coded signal in response to the selected first coded signal, and

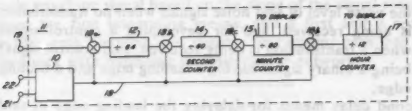
means for converting the read-out second coded signal into said corresponding voltages for application thereof to said reactance element, said channel selector memorizing electrical signals corresponding to tuning channels in said non-volatile memory, channel selection thereafter being effected by tuning said tuning circuit to a desired one of said channels by reading out said memorized signals.

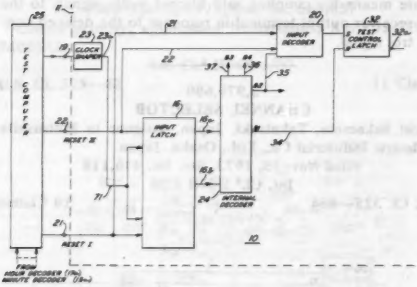
3,979,681

SYSTEM AND METHOD FOR DECODING RESET SIGNALS OF A TIMEPIECE FOR PROVIDING INTERNAL CONTROL

Edward H. Arnold, King of Prussia, Pa., assignor to Solid State Scientific, Inc., Montgomeryville, Pa.

Filed Nov. 27, 1974, Ser. No. 527,831
Int. Cl.² H03K *21/32*; G04C *3/00*; G04B *19/30*
U.S. Cl. 328—48 **16 Claims**





1. A solid state timing device responsive to reset signals and having a chain of series connected counters with clock pulses being applied to the beginning of the chain comprising

reset means coupled to predetermined ones of said counters for resetting selected ones of said counters upon application of predetermined reset signals; and

decoder means connected to said reset means but independent of said resetting of said counters for detecting the state of reset signals during a predetermined time duration for producing a control signal,

control means connected to said decoder means for providing predetermined internal control of said solid state timing device only upon application of said control signal.

7. A method of producing a control signal in a timing system responsive to reset signals and having a chain of series connected counters with clock pulses being applied to the beginning of the chain which comprises the steps of

a. resetting selected ones of said counters upon application of predetermined reset signals,

b. detecting and decoding the state of selected reset signals during a predetermined time duration for producing a control signal independent of resetting selected ones of the counters, and

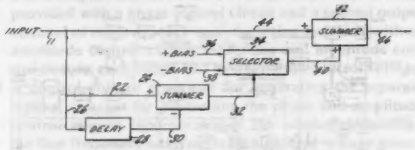
c. providing predetermined internal control of the timing system only upon production of the control signal.

3,979,682

HYSTERESIS COMPENSATOR FOR CONTROL SYSTEMS

Thomas R. Warwick, Jupiter, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 11, 1974, Ser. No. 531,635
Int. Cl.² H03K *17/10*
U.S. Cl. 328—162 **4 Claims**



1. In a control in which a control signal for a controlled device is produced in response to changes in an input signal, a time lag occurring in the response of said controlled device to changes in said input signal due to hysteresis in said control system, the improvement comprising:

an integrator, said input signal being connected to the input of said integrator, the output of said integrator changing in a direction determined by the polarity of said input signal;

a first source of a fixed bias signal having a first polarity and a second source of a fixed bias signal having a polarity opposite to said first polarity;

summing means having a pair of inputs and providing an output signal as a function of the summation of signals applied to its inputs, one of said inputs being connected to the output of said integrator; and

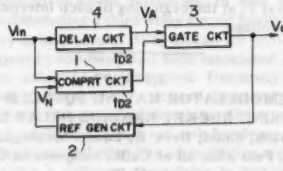
selector means connected to said input signal and responsive to the polarity thereof for connecting a corresponding one of said bias signal sources to the other input of said summing means, whereby the output of said summing means will be increased in value over the output of said integrator by the magnitude of said bias signals in response to a positive input signal and the output of said summing means will be decreased below the value of the output of said integrator by the magnitude of said bias signals in response to a negative input signal.

3,979,683

NOISE ELIMINATOR CIRCUIT

Tsuneo Ikeda, Oume, Japan, assignor to Hitachi, Ltd., Japan

Filed Jan. 6, 1975, Ser. No. 538,577
Claims priority, application Japan, Jan. 9, 1974, 49-5341
Int. Cl.² H04B *1/10*
U.S. Cl. 328—165 **13 Claims**



1. In a noise eliminator circuit comprising:

an input terminal to which an input signal from which a noise signal is to be removed is applied;

an output terminal;

first means, coupled to said input terminal, for detecting the existence of noise in said input signal; and

second means, coupled to said first means, for removing said noise from said input signal and coupling the resulting signal to said output terminal;

the improvement comprising

third means, coupled between said input terminal and said second means, for delaying the application of said input signal to said second means.

3,979,684

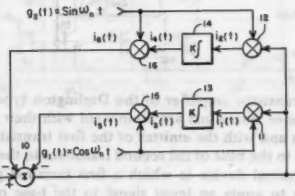
FEEDBACK FILTER SYSTEM

William F. Acker, 14241 82nd Ave. N., Seminole, Fla. 33542

Filed June 24, 1975, Ser. No. 589,980

Int. Cl.² H03H 7/10

U.S. Cl. 328—167 **19 Claims**



1. A feedback filtering system for filtering frequencies in an input signal, said filtering system comprising:

a first summing means to receive said input signal and to receive a first cancellation signal, said summing means being capable of combining said input signal and said first cancellation signal to form a first combined signal serving as a first filter signal;

a first translating means to receive said first filter signal, said first translating means being capable of translating said first filter signal in frequency by effective multiplication of said first filter signal with a periodic first tone selection signal to thereby provide a first intermediate signal;

a second translating means to also receive said first filter signal, said second translating means being capable of translating said first filter signal in frequency by effective multiplication of said first filter signal with a periodic second tone selection signal to thereby provide a second intermediate signal;

a third translating means to receive a third intermediate signal obtained from said first intermediate signal, said third translating means for translating said third intermediate signal in frequency by effective multiplication of said third intermediate signal with a periodic third tone selection signal to thereby provide a fifth intermediate signal, and

a fourth translating means to receive a fourth intermediate signal obtained from said second intermediate signal, said fourth translating means for translating said fourth intermediate signal in frequency by effective multiplication of said fourth intermediate signal with a periodic fourth tone selection signal to thereby provide a sixth intermediate signal, said first cancellation signal being obtained from said sixth intermediate signal.

3,979,685

FREQUENCY SHIFT KEY DEMODULATOR

David M. Motley, Santa Ana; King Y. Cheng, Tustin, and Richard W. Middlestead, El Toro, all of Calif., assignors to Hycom Incorporated, Irvine, Calif.

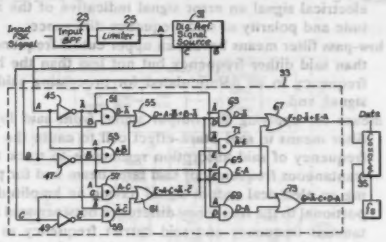
Filed Sept. 16, 1974, Ser. No. 506,209

Int. Cl.³ H03D 3/00; H04L 27/14

U.S. Cl. 329—105 **16 Claims**

15. A frequency shift key demodulator adapted to receive an analog signal having at least first and second frequencies comprising:

first means responsive to the analog signal for providing a first direction signal which includes a plurality of first pulses defining a first pulse train which occurs in response to the first frequency whereby the first pulse train provides an indication of the first frequency;



second means responsive to the analog signal for providing a second direction signal which includes a plurality of second pulses defining a second pulse train which occurs in response to the second frequency whereby the second pulse train provides an indication of the second frequency;

said first pulse train being different from said second pulse train; and

means responsive to said first and second pulses for indicating said first and second frequencies.

3,979,686

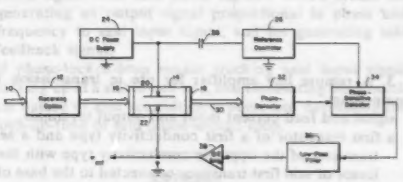
OPTICAL FREQUENCY MODULATION DEMODULATOR

Richard L. Abrams, Pacific Palisades, and Thomas A. Nussmeier, Thousand Oaks, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Sept. 8, 1975, Ser. No. 611,059

Int. Cl.³ G02F 2/00

U.S. Cl. 329—110 **4 Claims**



1. An optical frequency modulation demodulator for providing a signal indicative of the frequency modulation on a laser beam which is frequency modulated relative to a carrier frequency comprising:

a Stark-effect cell disposed in the path of said laser beam and containing a gas having an absorption resonance in the vicinity of said carrier frequency, the center frequency of said absorption resonance varying linearly as a function of the voltage applied to said Stark-effect cell in accordance with a predetermined frequency versus voltage characteristic;

means for applying a dc signal to said Stark-effect cell to adjust the center frequency of said absorption resonance to a value near said carrier frequency;

means for applying an alternating reference signal at a dither frequency higher than the highest frequency to be demodulated to said Stark-effect cell to vary the center frequency of said absorption resonance at said dither frequency and thereby amplitude modulate said laser beam such that the amplitude of the fundamental amplitude modulation component is indicative of the magni-

tude of the frequency difference between the instantaneous frequency of said laser beam and the average center frequency of said absorption resonance, and the phase of said fundamental amplitude modulation component is indicative of the polarity of said frequency difference;

means for producing an electrical signal corresponding to the amplitude modulation on said laser beam;

means for producing from said reference signal and said electrical signal an error signal indicative of the magnitude and polarity of said frequency difference;

low-pass filter means having an upper cutoff frequency less than said dither frequency but not less than the highest frequency to be demodulated for processing said error signal; and

means for applying the output signal from said low-pass filter means to said Stark-effect cell to cause the center frequency of said absorption resonance to track the instantaneous frequency of said laser beam and for providing an electrical output signal having an amplitude proportional to the frequency difference between said instantaneous frequency and said carrier frequency as determined by said frequency versus voltage characteristic.

3,979,687

LINE AMPLIFIER

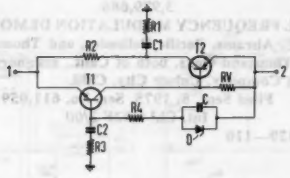
Otmar E. Ringelhaan, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 5, 1975, Ser. No. 610,759

Claims priority, application Germany, Sept. 20, 1974, 2445135

Int. Cl.² H03F 3/189

U.S. Cl. 330—17 **6 Claims**



3. A remote line amplifier for use in transmission lines, comprising:

signal and feed current input and output terminals,

a first transistor of a first conductivity type and a second transistor of the opposite conductivity type with the collector of said first transistor connected to the base of said second transistor,

a first impedance connected between ground and the collector of said second transistor,

a second impedance connected between said input terminal and the collector of said second transistor,

a third impedance connected between ground and the base of said first transistor,

a fourth impedance with one side connected to the base of said first transistor,

a Zener diode and a capacitor connected in parallel and connected between said fourth impedance and said output terminal,

a resistor connected between said output terminal and the base of said second transistor,

said output terminal connected to the emitter of said second transistor,

said input terminal connected to the emitter of said first transistor,

and the ratio of said second impedance to said first impedance equal to the desired amplification factor and the ratio of said fourth impedance to said third impedance equal to the desired amplification factor minus 1.

3,979,688

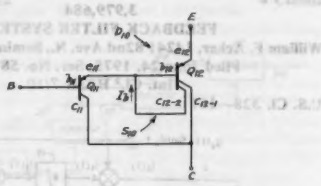
TRANSISTOR AMPLIFIER OF THE DARLINGTON TYPE WITH INTERNAL BIAS PROVIDING LOW OFFSET VOLTAGE AND OFFSET CURRENT DRIFT

Modesto A. Maidique, Lexington, Mass., assignor to Analog Devices, Inc., Norwood, Mass.

Continuation of Ser. No. 470,213, May 15, 1974, abandoned. This application Oct. 6, 1975, Ser. No. 619,600

Int. Cl.² H03F 3/45

U.S. Cl. 330—30 D **12 Claims**



1. In a transistor amplifier of the Darlington type in which two successive transistors are connected with their collectors in common and with the emitter of the first transistor supplying current to the base of the second transistor to thereby form a three terminal device in which a first terminal provides a connection to apply an input signal to the base of the first transistor, and in which a second terminal at the common connection of the collectors of said transistors and a third terminal at the emitter of the second transistor provide connections to apply the output current of the device, the improvement which comprises:

transistor means having base and emitter portions connected in common with the base and emitter of the second transistor, and having a collector portion connected to the emitter of the first transistor to direct through the first transistor a bias current which is a predetermined fraction of the collector current of the second transistor, and

the input impedance between the first and third terminals of the device being that presented by the base-to-emitter impedance of the first transistor operated at the bias current level determined by said transistor means, in series with the impedance presented between the emitter of the first transistor and the third terminal;

whereby the three terminal device will present a substantial input impedance to a signal source connected to said first terminal to avoid loading the source and to minimize the amount of current needed to drive the device, and at the same time will provide a highly predictable relationship between input voltage at said first terminal and output current through said second and third terminals.

3,979,689

DIFFERENTIAL AMPLIFIER CIRCUIT

Otto Heinrich Schade, Jr., N. Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 29, 1975, Ser. No. 545,091

Int. Cl.² H03F 3/45

U.S. Cl. 330—30 D **14 Claims**

9. A differential amplifier comprising, in combination:

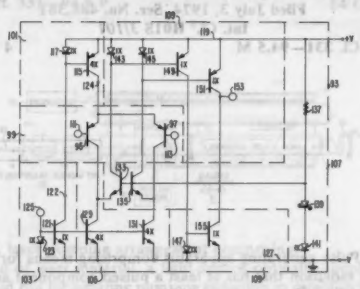
first and second terminals across which an operating voltage may be applied;

first and second transistors, each having base, emitter and collector electrodes, connected to one another at their emitter electrodes;

two signal input terminals, one coupled to each base electrode;

a current source, and first and second current sinks, said source coupling said emitter electrodes to said first terminal, said first current sink coupling one of said collector electrodes to said second terminal, and said second cur-

rent sink coupling the other of said collector electrodes to said second terminal, said two current sinks demanding together a total current which is substantially more than is available from said current source;



means coupled to said collector electrodes for maintaining said collector electrodes at a voltage level between that at said first terminal and that at said second terminal; and

means coupled to said collector electrodes for supplying the additional current demanded by said two current sinks.

3,979,690

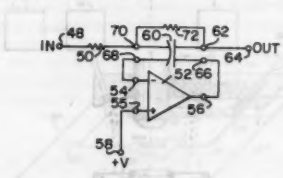
FAILSAFE CONTROLLED GAIN INVERTING AMPLIFIER APPARATUS

Thomas C. Matty, North Huntingdon, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 29, 1975, Ser. No. 572,814

Int. Cl.² H03F 1/36

U.S. Cl. 330—107 **12 Claims**



1. In an inverting amplifier apparatus having an input signal terminal and an output signal terminal and having a failsafe controlled gain in relation to predetermined failure modes, the combination comprising:

amplifier means having first and second inputs and an output;

a feedback impedance including a four terminal capacitor, with two terminals of that capacitor being connected between said first amplifier input and said output such that said gain decreases linearly over a known range of frequencies;

an input impedance connected between said input signal terminal and a third terminal of said four terminal capacitor; and

with said output signal terminal being connected to the fourth terminal of said capacitor.

3,979,691

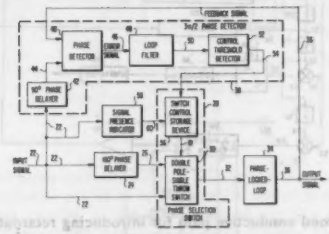
ACQUISITION PROCESS IN A PHASE-LOCKED-LOOP BY SWITCHED PHASE MEANS

Layton Balliet, Huntsville, Ala., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1975, Ser. No. 591,385

Int. Cl.² H03B 3/04

U.S. Cl. 331—1 A **3 Claims**



1. A phase-locked-loop circuit configuration for improving the acquisition process comprising:

3π/2 phase detector means for comparing the phase between an input signal and a feedback signal providing at its output a threshold step signal proportional thereto;

signal presence indicator means driven by said input signal for generating an indicator step signal when an input signal is present;

180° phase delayer means driven by said input signal for delaying said input signal by substantially 180°;

phase selection switch means driven by said input signal, said threshold step signal from said 3π/2 phase detector means and said delayed input signal from 180° phase delayer means for providing at its output a selected signal of the correct phase;

phase-locked-loop means driven by said correct selected phase signal from said phase selector switch means for generating an output signal proportional in phase and frequency to said input signal, and for generating said feedback signal;

said phase-locked-loop means tracking said input signal locking up at a stable null π/2, and eliminating the statistical nature of said acquisition process and decreasing the lock-up-time of said phase-locked-loop.

3,979,692

APPARATUS FOR PHASE KEYING IN FREQUENCY AND PHASE VOLTAGE CONTROLLED OSCILLATOR WITH AN INCOMING SIGNAL HAVING A T PERIOD, AND PHASE CODED OF THE BIPHASE PCM TYPE OR PSK TYPE

Jean-Charles Benoist, Le Chesnay; Francois Bitsch, Fourqueux, and Gerard Rene Joseph Tarel, Ramonville-Saintagne, all of France, assignors to Electronique Marcel Dassault, Paris, France

Filed Aug. 4, 1975, Ser. No. 601,446

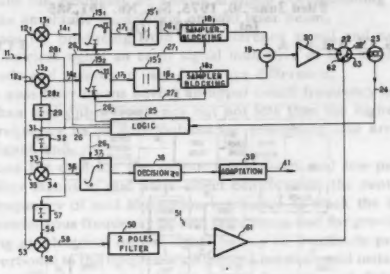
Claims priority, application France, Aug. 6, 1974, 74.27339

Int. Cl.² H03B 3/04

U.S. Cl. 331—1 A **5 Claims**

1. Apparatus for phase keying in frequency and phase voltage controlled oscillator with an incoming signal having a T period, and phase coded, of the biphase PCM type or PSK type comprising a circuit loop for phase controlling said oscillator with logic circuitry and first and second conductive paths having first and second integrators respectively, the integration time of each of said first and second integrators being equal to the period T of the incoming signal, the limits of integration time of said first integrator being −T/8 and +7T/8

and that of said second integrator being +T/8 and +9T/8, and a delay element interposed between the logic circuitry and



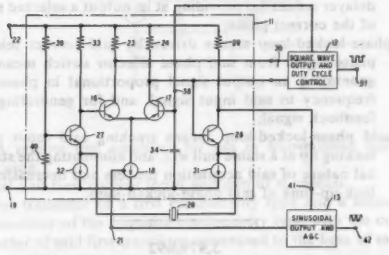
said second conductive path for introducing retardation time of T/4.

3,979,693

CRYSTAL-CONTROLLED OSCILLATOR HAVING SINUSOIDAL AND SQUARE-WAVE OUTPUT SIGNALS

Veikko Reynold Saari, Spring Lake Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 29, 1975, Ser. No. 609,163
Int. Cl.² H03B 5/36; H03K 3/26
U.S. Cl. 331—61 **19 Claims**



1. A crystal-controlled oscillator circuit comprising:

an oscillator stage including a differential amplifier circuit having first and second input terminals and first and second output terminals, said differential amplifier including means responsive to an applied gain control signal for controlling the gain of said amplifier and means for connecting a piezoelectric crystal in a substantially zero phase shift feedback path between one of said amplifier output terminals and one of said amplifier input terminals;

means responsive to the output signal of said oscillator stage for supplying a square-wave output signal to an output terminal; and

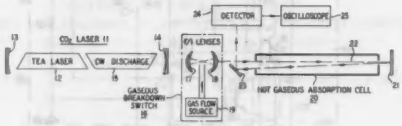
duty cycle control means responsive to the output signal of said oscillator stage for supplying a direct current control signal to said differential amplifier circuit of said oscillator stage, said direct current control signal controlling the bias current of said oscillator stage differential amplifier to maintain the duty cycle of said square-wave output signal at substantially 50%.

3,979,694

SHORT LASER PULSE GENERATION BY GAS BREAKDOWN SWITCHING AND HIGHLY SELECTIVE SPECTRAL FILTERING

Julius Goldhar, Boston, Mass., and Eli Yablonovitch, Shrewsbury, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 3, 1974, Ser. No. 485,361
Int. Cl.² H01S 3/101
U.S. Cl. 331—94.5 M **4 Claims**



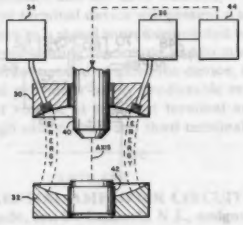
1. Pulse generating apparatus comprising means for generating radiation that has at least a pulsed component and that is capable of producing breakdown in a gaseous medium, means including focusing means and said gaseous medium in tandem with said generating means for producing said breakdown in a step-wise fashion, thereby producing upper and lower sidebands of said radiation, and means in tandem with said gaseous medium for transmitting both sidebands of said radiation yielded by said breakdown and for blocking the residual radiation of said generating means.

3,979,695

HIGH ORDER BEAM MODE RESONATOR

Clifford W. Erickson, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 20, 1974, Ser. No. 534,996
Int. Cl.² H01S 3/08
U.S. Cl. 331—94.5 C **16 Claims**



1. Apparatus for producing beam modes, the apparatus comprising:

beam resonant cavity means comprising concave curved surfaces separated from one another along an axis; and

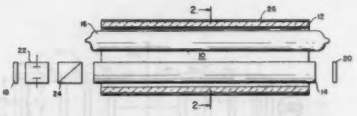
energy source means for introducing coherent wave energy having a wavelength between about 0.1 mm and about 10 cm into the beam resonant cavity means through a position not on the axis.

3,979,696

LASER PUMPING CAVITY WITH POLYCRYSTALLINE POWDER COATING

William W. Buchman, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed June 30, 1975, Ser. No. 591,263
Int. Cl.² H01S 3/091
U.S. Cl. 331—94.5 P 14 Claims



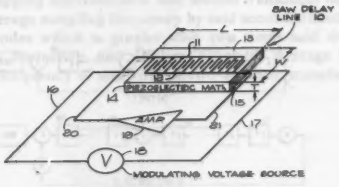
1. A laser pumping arrangement comprising:
a rod of laser material, a light source optically coupled to said rod for emitting pumping radiation to establish population inversion in said laser material between a pair of energy levels such that said rod emits laser radiation at a lasing wavelength corresponding to the energy difference between said energy levels;
a housing member laterally surrounding said rod and said light source; and
a coating on a lateral surface of said housing member, said coating including a polycrystalline powder absorptive of radiation at said lasing wavelength and having a thickness sufficient to provide a high diffuse reflectivity for said pumping radiation.

3,979,697

FREQUENCY MODULATED SAW OSCILLATOR

Thomas H. Donahue, North Hollywood, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 3, 1975, Ser. No. 628,082
Int. Cl.² H03B 5/32
U.S. Cl. 331—107 A 10 Claims



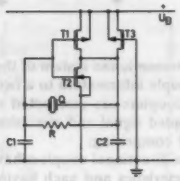
1. An oscillator comprising:
an amplifier including a positive feedback path;
a surface acoustic wave device including a piezoelectric substrate and two sets of interdigital fingers affixed to said substrate, the circuit between said two finger sets being connected within said feedback path, said device thereby operating as the frequency determining element of said oscillator;
and means for applying an electric field gradient through said substrate substantially parallel to the direction of acoustic wave propagation, thereby to vary the effective length of said substrate and, as a result, the frequency of oscillation,

3,979,698

CRYSTAL OSCILLATOR CIRCUIT

Wolfgang Gollinger, Gundelfingen, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 510,928, Oct. 1, 1974, abandoned.
This application Sept. 8, 1975, Ser. No. 611,051
Claims priority, application Germany, Oct. 19, 1973, 2352421
Int. Cl.² H03B 5/36
U.S. Cl. 331—116 R 4 Claims

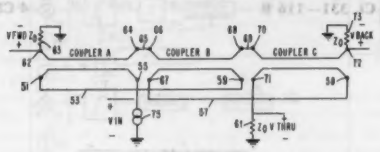


1. A crystal oscillator circuit comprising:
a supply voltage source having a ground terminal and a voltage supply terminal;
a p-channel insulated-gate field effect transistor having a source electrode, a drain electrode, a gate electrode and a substrate terminal;
a n-channel insulated-gate field effect transistor having a source electrode, a drain electrode, a gate electrode and a substrate terminal;
said p-channel and said n-channel transistors having their drain electrode-source electrode paths directly coupled in series with each other and between said ground terminal and said voltage supply terminal;
first means to connect said gate electrodes of said p-channel and said n-channel transistors together;
second means to connect said substrate terminal of said p-channel transistor to said voltage supply terminal;
third means to connect said substrate terminal of said n-channel transistor to said ground terminal;
a crystal having two terminals, one of said two terminals being coupled to said first means and the other of said two terminals being coupled to said drain electrode junction of said series connected drain electrode-source electrode paths;
a resistor coupled in parallel with said crystal;
a first capacitor connected between said one of said two terminals and said ground terminal;
a second capacitor connected between the other of said two terminals and said ground terminal; and one additional insulated-gate field effect transistor having a source electrode, a drain electrode, a gate electrode and substrate terminal;
said additional transistor having its drain electrode-source electrode path directly coupled in parallel with said drain electrode-source electrode path of one of said p-channel and said n-channel transistors;
said additional transistor being of the same channel type as said one of said p-channel and said n-channel transistors having its gate electrode coupled to the appropriate one of said voltage supply and ground terminals and its substrate terminal coupled identical to said one of said p-channel and said n-channel transistors.

3,979,699
DIRECTIONAL COUPLER CASCADING FOR SIGNAL ENHANCEMENT

Edward S. Caragliano, Poughkeepsie, and Howard H. Nick, LaGrangeville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,254
Int. Cl.² H01P 5/18
U.S. Cl. 333—10 **6 Claims**



1. In a data transmission system of the type using directional couplers to couple information to a two way transmission line wherein said couplers are connected to enhance the desired backward coupled signal and minimize the parasitic forward coupled signal comprising;

at least three directional couplers having fixed equal electrical characteristics and each having an input terminal, a backward coupled signal output terminal, a thru terminal and a forward coupled signal terminal;

signal input means connected to said input terminal of the first directional coupler of said at least three directional couplers;

a first minimum delay means connecting the thru terminal of each of said directional couplers except the last one to said input terminal of the succeeding directional coupler;

a second minimum delay means connecting the backward coupled signal terminal of each of said directional couplers except the last one to the forward coupled signal terminal of the succeeding directional coupler; and

means for terminating said forward coupled signal terminal of said first coupler and the thru terminal and the backward coupled signal output terminal of the last coupler in a characteristic impedance of the line to which said terminals are connected, the backward coupled signal of each directional coupler arriving simultaneously at said backward coupled signal output terminal to produce an enhanced backward coupled signal at the backward coupled signal output terminal of the last coupler of said plurality of couplers and said parasitic forward coupled signals arriving at said forward terminal of the first directional coupler out of coincidence thereby minimizing said parasitic forward coupled signal.

3,979,700
VIDEO PROCESSOR

John C. Groce, Woodland Hills, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 1, 1974, Ser. No. 493,673
Int. Cl.² H03H 9/26, 9/32, 9/30; G11C 11/22
U.S. Cl. 333—30 R **10 Claims**

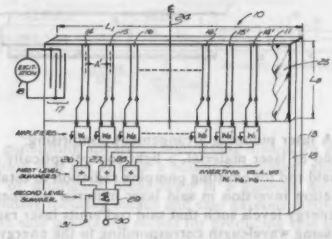
1. A video signal processor comprising:

a piezoelectric substrate having at least one elongated dimension;

first means for launching a surface acoustic wave along a surface of said piezoelectric substrate, said first means being responsive to an input signal representative of a video signal train;

second means comprising a plurality N of interdigital electrode sensor pairs substantially uniformly distributed along the surface of said piezoelectric substrate so as to each receive an electric signal as said surface acoustic wave progresses, said sensor pairs being contained within said elongated dimension over a sensing length equal to the distance traveled by the leading edge of said surface wave over the duration of said video signal train;

third means comprising N/2 first summation circuits, each of said summation circuits being connected to sum the signal generated at a discrete one of said pair sensors in the first half of said N sensor pairs with that generated by a corresponding sensor pair spaced by the same number of said pairs from the center of said plurality of N sensor pairs within the second half of said sensor pairs;



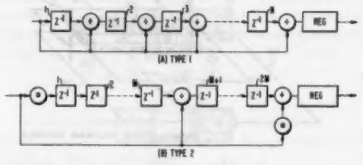
fourth means within said third means for inverting the polarity of the detected signal from each of said sensor pairs in said second half of said N sensor pairs before application to said first summation circuits;

and fifth means comprising a second summation circuit connected to sum the outputs of said first summation circuits to provide an output signal.

3,979,701
NON-RECURSIVE DIGITAL FILTER EMPLOYING SIMPLE COEFFICIENTS

Atsushi Tomozawa, Gaithersburg, Md., assignor to Communications Satellite Corporation (Comsat), Washington, D.C.

Filed June 17, 1975, Ser. No. 587,774
Int. Cl.² H03H 7/28
U.S. Cl. 333—70 T **6 Claims**



1. A non-recursive digital filter comprising:

a. a first section of N delay elements, the coefficient value of all the taps of said delay elements being one;

b. a second section of 2M delay elements, the coefficient value of all the taps of said delay elements being an integer power of two;

c. said first section utilized for forming the desired loss characteristics of said filter and said second section utilized for shaping the passband of said filter; and

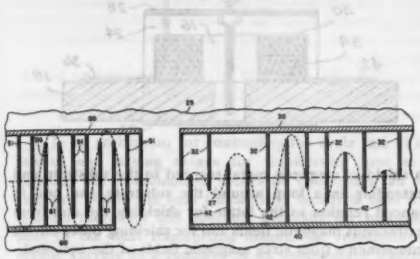
d. said first and second sections operably coupled such that the resulting grouping has a tap coefficient of an integer power of two.

3,979,702

APPARATUS AND METHOD FOR OVERSAMPLED TRANSDUCERS IN ACOUSTIC SURFACE WAVE DEVICES

Bill J. Hunsinger, Mahomet, and Jerry H. Peppler, Fort Wayne, both of Ind., assignors to The Magnavox Company, Fort Wayne, Ind.

Filed Apr. 8, 1974, Ser. No. 458,940
Int. Cl.² H03H 7/10
U.S. Cl. 333—72 10 Claims



1. A electro-acoustic device for producing a predetermined frequency response comprising:

an acoustic-wave propagating medium;

a first electro-acoustic transducer coupled to said medium, said first transducer including at least a pair of overlapping sampling electrode sets, said first transducer having an average sampling frequency by said first transducer electrodes which is greater than two times a design center frequency of said predetermined frequency response; and

a second electro-acoustic transducer coupled to said medium, said second transducer including at least a pair of overlapping electrode sets, said second transducer having an average sampling frequency by said second transducer electrodes which is greater than two times said design center frequency, and different from the average sampling frequency of said first electro-acoustic transducer.

3,979,703

WAVEGUIDE SWITCH

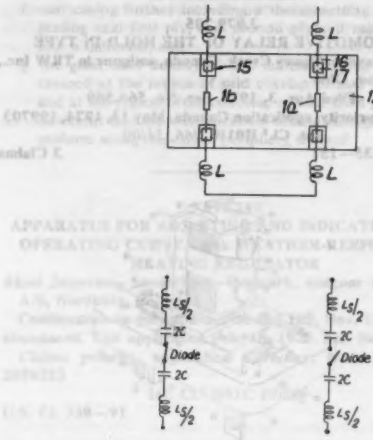
George Frederick Craven, Bushey Heath, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 12, 1974, Ser. No. 531,944
Claims priority, application United Kingdom, Feb. 7, 1974, 5675/74
Int. Cl.² H01P 1/15
U.S. Cl. 333—98 S 2 Claims

1. A waveguide switch comprising:

a waveguide; and

a first PIN diode across the full height of said waveguide having terminal connections within said waveguide, said terminal connections providing relatively low inductance and relatively high capacitance such that when the diode is ON, the combination of said diode and said terminal connections in series resonant within the frequency band of operation, said first PIN diode and said terminal connections transversely displaced from the waveguide center line.

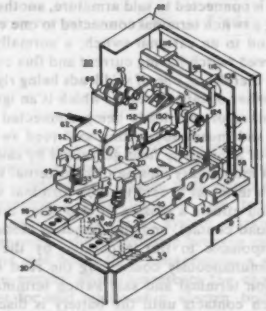


3,979,704

CIRCUIT BREAKER HAVING MEMBERS COATED WITH PHOSPHATE-CHROMATE PROTECTIVE LAYERS

Richard D. Buckley, and John Hilko, both of Athens, Ga., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 23, 1975, Ser. No. 580,507
Int. Cl.² H01H 75/00
U.S. Cl. 335—6 10 Claims



1. A transformer, having a housing, with a circuit breaker switchable between an open position wherein the electrical connections through the transformer are open and a closed position wherein the electrical connections through the transformer are closed disposed within the housing and immersed in an insulating liquid dielectric; the circuit breaker comprising metallic sensing, tripping and supporting members, wherein a plurality of said members are coated with a dual protective film comprising a first phosphate layer selected from the group consisting of zinc phosphate and iron phosphate about 0.00001 to about 0.0004 inch thick, covered by an outside layer comprising a chromate selected from the group consisting of zinc chromate, zinc dichromate and mixtures thereof about 0.00001 to about 0.0004 inch thick, said

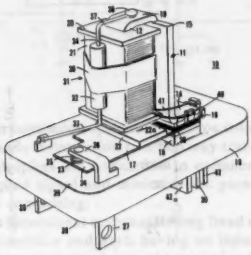
protective film being resistant to the contacting liquid dielectric.

3,979,705

AUTOMOTIVE RELAY OF THE HOLD-IN TYPE

Rodney Hayden, Stoney Creek, Canada, assignor to TRW Inc., Cleveland, Ohio

Filed Apr. 3, 1975, Ser. No. 564,589
Claims priority, application Canada, May 13, 1974, 199703
Int. Cl.² H01H 1/66, 51/00
U.S. Cl. 335—151 3 Claims



1. An automotive relay structure of the hold-in type comprising: a relay unit having a ferrous core and a relay winding on said core; a movable armature fastened to said core and carrying a movable core part and having a relay contact on the free end thereof; an insulate base rigidly supporting said relay unit on one face of said base; at least five rigid terminal members extending from said face through said base to provide male terminal members extending beyond the other surface of said base; one of said terminal members being a load terminal carrying a stationary contact disposed in normally open, spaced relationship to said movable contact on the free end of said armature, another of said terminals being a battery terminal which is connected to said armature, another of said terminals being a switch terminal connected to one end of said relay winding and to an external switch; a normally open flux responsive reed switch having current and flux conducting leads extending therefrom, one of said leads being rigidly connected to still another of said terminals which is an ignition terminal, and the other of said leads being connected to said switch terminal; and means supporting said reed switch within the influence of a magnetic field generated by said relay winding whereby a momentary closing of an external switch connects said switch terminal to said ignition terminal which energizes the coil and effects a closing of said relay armature contact and said load contact, and simultaneous closure of said reed switch responsive to flux generated by the relay winding thereby simultaneously connecting the reed switch between said ignition terminal and said switch terminal through said reed switch contacts until the battery is disconnected from said ignition terminal or ground removed.

3,979,706

SHIELDED INDUCTANCE COIL WITH TRIMMER

Thomas A. Jennings, Glenside, Pa., assignor to Hull Corporation, Hatboro, Pa.

Continuation of Ser. No. 434,905, Jan. 21, 1974, abandoned.
This application June 26, 1975, Ser. No. 590,621
Int. Cl.² H01F 21/06
U.S. Cl. 336—83 2 Claims

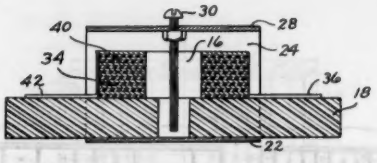
1. A shielded and trimmable microelectronic inductance coil, comprising:

a. a substrate of dielectric material having an opening therethrough,

b. a plurality of overlapping coaxial turns of electrically conductive metal films, the turns being separated electrically from each other by interposed films of dielectric material, the metal and dielectric films being bonded together as an integrated, one-piece unit forming an inductance coil having a central opening therethrough,

c. the coil being mounted on one surface of the substrate with said openings in axial alignment,

d. a pair of electric terminals extending laterally from the ends of the metal film of the coil and supported on said one surface of the substrate,



e. a shield of magnetic metal secured to the substrate and extending in a loop around the substrate and coil in spaced relation to the latter for shielding the coil from extraneous magnetic fields and for shielding other circuit components from stray magnetic fields of the coil, and

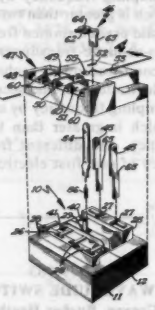
f. a rod of magnetic metal mounted in engagement with the side of the shield overlying the coil opposite the substrate for movement through the aligned openings in the coil and substrate, for varying the spacing between the inner end of the rod and the confronting opposite side of the shield exposed through the opening in the substrate.

3,979,707

POWER-PACK ASSEMBLY

Luther T. Prince, Jr., Minneapolis, Minn., assignor to Ault Incorporated, Minneapolis, Minn.

Filed Feb. 7, 1975, Ser. No. 547,781
Int. Cl.² H01F 15/10
U.S. Cl. 336—107 14 Claims



1. In a power-pack assembly of the type having a bobbin, at least primary and secondary windings wound on said bobbin, core means carried by said bobbin, input and output terminals electrically connected to said windings and core grounding terminal means, the improvement comprising:

solderless connection means including electrically conductive clip means secured to said bobbin and mechanically and electrically engaging said input and output terminals and means electrically connected to one of said windings;

means securing said core-grounding terminal means to said bobbin; and

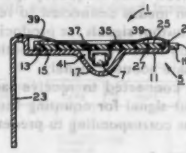
electrically conductive means resiliently engaging said core-grounding terminal means and said core.

3,979,708

THERMOSTAT AND ANTICIPATOR THEREFOR

Paige W. Thompson, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Nov. 4, 1974, Ser. No. 520,876
Int. Cl.[2] H01H *61/02*
U.S. Cl. 337—107 26 Claims



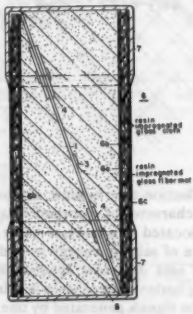
1. In an anticipator for controlling the cycle rate of a thermostat ahd having means for transferring heat supplied thereto; the combination therewith comprising an NTCR enclosed within the heat transferring means in heat transfer relation therewith and operable generally for supplying the heat to the heat transferring means, the resistance of the NTCR varying as a function of its temperature wherein the NTCR is adapted to be responsive to current applied thereto to attain an operating temperature appreciably in excess of that of the ambient in which the anticipator may be located.

3,979,709

ELECTRIC FUSE HAVING A MULTIPLY CASING OF A SYNTHETIC - RESIN GLASS-CLOTH LAMINATE

Daniel P. Healey, Jr., Merrimacport, Mass., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Filed May 22, 1975, Ser. No. 579,972
Int. Cl.[2] H01H *85/02*
U.S. Cl. 337—186 22 Claims



1. An electric fuse comprising:

a. a fusible element;

b. an arc-quenching means surrounding said fusible element;

c. a casing of synthetic-resin-glass-cloth laminate housing said fusible element and said arc-quenching means;

d. a pair of terminal elements arranged on the ends of, and supported by, said casing and conductively interconnected by said fusible element;

e. said casing including a first ply formed of glass fiber mat material having non-uniformly oriented fibers, said casing further including a second and a third ply arranged on opposite sides of said first ply and sandwiching said first ply, said second ply and said third ply each being of woven glass fiber fabric and each said second and said third ply forming an overlap extending in a direction longitudinally of said casing, said overlap of said second ply and said overlap of said third ply being angularly displaced relative to each other;

f. said casing further including a thermosetting resin integrating said first ply, said second ply and said third ply into a laminate; and

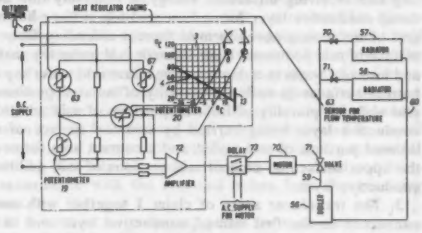
g. the glass fiber density of said laminate being locally increased at the region of said overlap of said second ply and at the region of said overlap of said third ply to such an extent that the wall thickness of said casing is virtually uniform along the entire periphery thereof.

3,979,710

APPARATUS FOR ADJUSTING AND INDICATING THE OPERATING CURVE OF A WEATHER-RESPONSIVE HEATING REGULATOR

Aksel Jespersen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Continuation-in-part of Ser. No. 198,159, Nov. 12, 1971, abandoned. This application Feb. 18, 1975, Ser. No. 550,187
Claims priority, application Germany, Nov. 16, 1970, 2056253
Int. Cl.[2] H01C *10/00*
U.S. Cl. 338—91 5 Claims



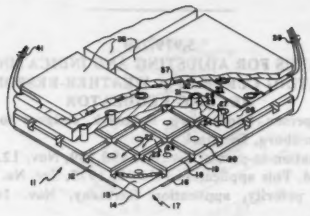
1. A heat regulating unit for controlling the supply rate of a boiler fluid having a predetermined temperature in accordance with the outdoor temperature to in effect maintain a selected predetermined ratio between said temperatures, comprising, a casing, a coordinate system marked on said casing which represents the relationship between said outdoor temperature and said boiler fluid temperature, a pointer for said coordinate system which represents the characteristic operating curve for said relationship, electric bridge circuit means mounted partially in said casing having two branches for receiving temperature responsive variable resistance resistors for sensing the outdoor temperature and the boiler fluid temperature, first and second potentiometers for the other two branches of said bridge mounted in said casing, first and second slide members mounted for sliding movement in said casing, said pointer being pivotally mounted on said first slide member for translatory movement therewith and pivotal movement relative thereto, said first and second potentiometers having control means operably attached to said slide members with said first potentiometer being controlled in accordance with the indicated level of said pointer and said second potentiometer being controlled in accordance with the slope of said pointer, and means for adjustably positioning said slide members to move said pointer to a desired position which results in imparting desired settings to said potentiometers.

3,979,711

ULTRASONIC TRANSDUCER ARRAY AND IMAGING SYSTEM

Maxwell G. Maginness, Palo Alto; James D. Meindl, Los Altos, and James D. Plummer, Mountain View, all of Calif., assignors to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Filed June 17, 1974, Ser. No. 480,609
Int. Cl.[2] G01S 9/66; H04R 17/00
U.S. Cl. 340—1 R 4 Claims



1. In an ultrasonic transducer array, a relatively thin wafer of piezoelectric material having planar, substantially parallel top and bottom surfaces, a relatively thin conductive layer formed on said bottom surface, said outermost surface of said layer forming a major face capable of bidirectionally transmitting and receiving ultrasonic energy, a relatively thin additional conductive layer formed on said top surface having a grid of isolation grooves formed therein extending from the surface of said additional layer through said wafer top surface and into said wafer to a depth intermediate said wafer top and bottom surfaces to define a plurality of isolated portions in said wafer, a plurality of isolated portions of said additional conductive layer being carried by said top surface of said isolated portions of said wafer, and a contact area formed in the upper surface of each of said portions of said additional conductive layer.

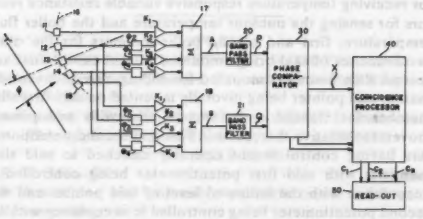
3. The transducer array of claim 1 together with means connected to the first named conductive layer and to the contact areas of the isolated portions of the additional conductive layer for bi-directionally providing and receiving electrical energy across the transducer elements formed thereby.

3,979,712

SENSOR ARRAY ACOUSTIC DETECTION SYSTEM

Kurt L. Ettenhofer, Swarthmore; Richard L. Thomas, Furlong, and John L. Harris, Ivyland, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 5, 1971, Ser. No. 197,185
Int. Cl.[2] G01S 3/80
U.S. Cl. 340—6 R 5 Claims



1. An acoustic detection system for detecting the presence and the propagation path of a coherent acoustic signal emanating from a stationary source against random background signals comprising, in combination:

sensor means for detecting the acoustic and background signals and producing output signals indicative of the azimuths thereof relative to a reference plane;

filter means connected to receive said sensor means output signals for producing output signals indicative of a predetermined narrow-band frequency spectrum thereof;

phase detection means connected to receive pairs of said filter means output signals for producing an output signal in serial binary form whose pulse width is indicative of the azimuth of said acoustic signal;

sorting means connected to receive said phase detection means output signal for counting the number of pulses within widths corresponding to predetermined sectors of azimuth;

threshold means connected to said sorting means for enabling a sorting means output signal when said aximuths accumulated within any one sector exceed a predetermined number; and

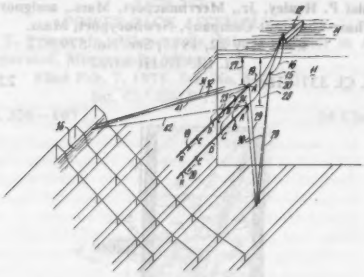
readout means connected to receive said sorting means output signal for displaying the sector exceeding said predetermined number.

3,979,713

METHOD OF MARINE REFLECTION-TYPE SEISMIC EXPLORATION

Alvin L. Parrack, Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Aug. 19, 1974, Ser. No. 498,787
Int. Cl.[2] G01V 1/00; H04B 13/00; H04R 15/00
U.S. Cl. 340—7 R 7 Claims



1. In marine reflection-type seismic exploration, a method for improving the character of recorded data developed from seismic detectors located in a body of water, comprising

creating a source of seismic energy in said body of water,

locating two of said detectors spaced vertically apart at corresponding horizontal positions in said body of water,

subtracting all the signals generated by one of said detectors from all the signals generated by the other of said detectors in order to cancel horizontally travelling seismic energy arriving simultaneously while reinforcing vertically travelling energy arriving about ½ cycle out of phase.

3,979,714

TWO-RECEIVER, VARIABLE-DENSITY LOGGING SYSTEM

Joseph Zemanek, Jr., Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed July 17, 1974, Ser. No. 489,203
Int. Cl.[2] G01V 1/34, 1/40
U.S. Cl. 340—15.5 DS 8 Claims

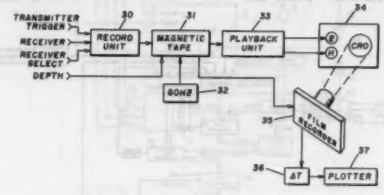
1. A method of determining the interval velocity of acoustic pulses that are generated by a transmitter within a borehole

and travel through the formation surrounding the borehole to a pair of receivers located at spaced-apart, axial positions within the borehole, comprising the steps of:

a. moving the transmitter and the pair of receivers through the borehole,

b. triggering the sweep of a cathode-ray oscilloscope in response to each acoustic pulse,

c. intensity modulating alternate sweeps of the cathode-ray oscilloscope with signals received from alternate receivers,



d. reproducing each sweep of the cathode-ray oscilloscope to produce a pair of variable-density curves representing the traveltime arrivals of the acoustic pulses at the pair of receivers,

e. digitizing said pair of variable-density curves at a plurality of selected points along said curves, and

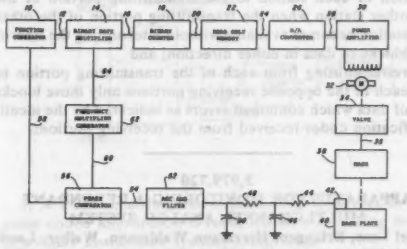
f. subtracting the digitized values of each curve at each of said plurality of points to obtain the traveltime of the acoustic pulses between the pair of receivers at each of the selected points along said curves.

3,979,715

METHOD AND SYSTEM FOR ACHIEVING VIBRATOR PHASE LOCK

Alferd Gene Hufstedler, Dallas; Ronald Ray Weaver, Houston, and Billy Ray Slater, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 28, 1974, Ser. No. 501,410
Int. Cl.² G01V 1/14
U.S. Cl. 340—15.5 TD **17 Claims**



1. A method for achieving a desired phase relationship between a reference signal and a feedback signal representing the baseplate motion of a swept frequency seismic source comprising:

a. measuring the degree and sense of any existing phase error between said reference signal and said feedback signal,

b. when said source is operating in an upsweep mode, and for any measured phase error falling within a range of phase errors having an extent greater than 180°, making a phase correction by slowing down the baseplate drive, and

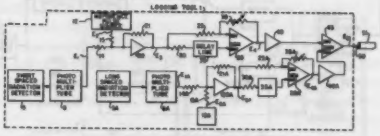
c. when said source is operating in a downsweep mode, and for any measured phase error falling within a range of phase errors having an extent greater than 180°, making a phase correction by speeding up the baseplate drive.

3,979,716

MEANS AND METHOD FOR TRANSMITTING A HIGH COUNT RATE PULSE SIGNAL OVER A COMMON WELL LOGGING CABLE

Robert W. Pitts, Jr., and Houston A. Whatley, Jr., both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Aug. 28, 1974, Ser. No. 501,376
Int. Cl.² G01V 1/40, 5/00
U.S. Cl. 340—18 P **27 Claims**



1. A well logging system for providing an output corresponding to a condition sensed in a borehole, comprising a logging instrument including sensing means for sensing the condition and providing data pulses of one polarity, corresponding in number and peak amplitude to the sensed condition, means connected to said sensing means for delaying each data pulse for a predetermined time interval to provide a corresponding delayed data pulse, pulse means connected to the delaying means and to the sensing means for providing a pair of pulses for each data pulse and corresponding thereto in accordance with the data pulse and its corresponding delayed data pulse, one pulse of each pair of pulses being of one polarity while the other pulse starts upon completion of the one pulse and is of an opposite polarity, a transmission system comprising a cable connected to said logging instrument; said logging instrument further includes means for applying the pairs of pulses from said pulse means to one end of said transmission system; and surface electronics adjacent to the borehole comprises means coupled to the other end of said transmission system for receiving said pulses transmitted by way of the cable, and means connected to the receiving means for providing the output corresponding to said sensed condition in accordance with the received pulses from the receiving means.

16. A method for preparing pulses for transmission over a well logging cable, comprising providing a pair of output pulses which comprises the steps of receiving pulses, delaying the received pulses for a predetermined time interval, providing a pair of pulses for each received pulse in accordance with the received pulse and the corresponding delayed received pulse in a manner so that one pulse of the pair of pulses has one polarity while the other pulse starts upon completion of the one pulse and has an opposite polarity, and applying the pair of pulses to the well logging cable.

3,979,717

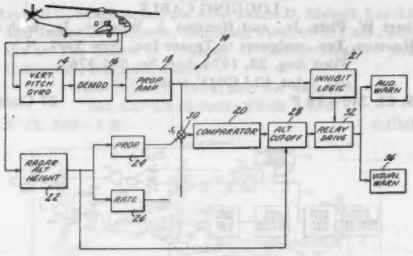
HELICOPTER WARNING SYSTEM

Ronald E. Barnum, Trumbull; Franklin A. Tefft, Killingworth, and Louis S. Cotton, Monroe, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 476,126, June 3, 1974, abandoned. This application Mar. 18, 1975, Ser. No. 559,452
Int. Cl.² G01C 5/00
U.S. Cl. 340—27 R **6 Claims**

1. For a helicopter of the type that includes a tail stabilizer or tail skid, means for providing a warning signal solely when the tail is in a position that it might contact the ground, and for avoiding the signal when the helicopter lands normally, said means including a first operational amplifier providing a first voltage signal that is proportional to helicopter altitude, a second operational amplifier for providing a second voltage signal that is proportional to a helicopter attitude, a voltage comparator responsive to said first and second voltage signals, audio or visual warning means responsive to said comparator for being actuated whenever the voltage of said first voltage

signal is equal to and opposite in polarity from said second voltage signal, and a third operational amplifier responsive to



the rate of descent of said helicopter for producing a bias voltage on said first voltage signal.

3,979,718

METHOD OF DRIVING A PLASMA DISPLAY PANEL

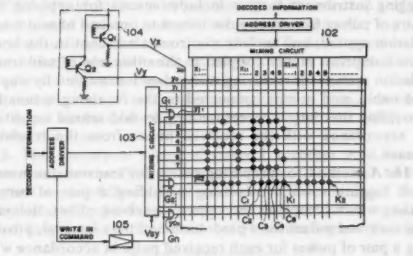
Shozo Umeda, Kakogawa; Tadatsugu Hirose, Akashi, and Shizuo Andoh, Kobe, all of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

Continuation of Ser. No. 317,643, Dec. 22, 1972. This application Jan. 10, 1975, Ser. No. 539,969

Claims priority, application Japan, Dec. 23, 1971, 46-104841

Int. Cl.² G06F *3/14*

U.S. Cl. 340—324 M **10 Claims**



1. A method of driving a plasma display panel having first and second pluralities of electrodes disposed to traverse each other in matrix form and each being covered with a dielectric layer whereby a plurality of display discharge points are formed across a confined discharge gas between said dielectric layers, a cursor indicating line being formed of selected discharge points associated with a third plurality of electrodes, wherein said method comprises the steps of:

a. applying a sustain voltage of substantially square wave form to said first, second and third pluralities of electrodes;

b. applying a write signal to selected ones of said first and second pluralities of electrodes defining selected display discharge points;

c. applying a priming pulse coincident in timing with said write signal to said third plurality of electrodes associated with said cursor indicating line establishing discharge across the cursor indicating discharge points at substantially the same timing as discharge is established by the writing signal across said selected display discharge points and

d. continuing to apply said sustain voltage after said priming pulse and said write signal terminate, to maintain said discharge at said cursor indicating discharge points and said selected display discharge points.

3,979,719

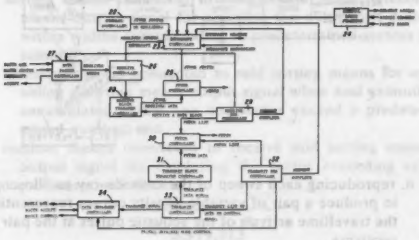
MULTIPLE BLOCK BINARY SYNCHRONOUS DUPLEX COMMUNICATIONS SYSTEM AND ITS METHOD OF OPERATION

John R. Tooley; Larry D. Scott, and Hatcher E. Chalkley, all of Austin, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 347,252, April 2, 1973, abandoned. This application Mar. 3, 1975, Ser. No. 554,817

Int. Cl.² G08C *25/00*

U.S. Cl. 340—146.1 BA **5 Claims**



1. In a communications system in which a first and a second station, each having a transmitter and receiver portion, simultaneously transmits and receives blocks of data, a method of controlling the stations including the steps of:

a. continuously transmitting blocks of data including a respective identification code for each block of data from each station to the other station;

b. checking the received blocks of data at the receiving portion of each station to determine if the received blocks of data contain errors;

c. acknowledging receipt of those blocks determined to be correctly received;

d. storing at each station the identification codes of those blocks of received data which contain an error;

e. transmitting the identification code of the blocks of received data which contain errors from the receiving portion of each station to the transmitting portion of the other station when the transmitting portion of the other station becomes available without interrupting the flow of blocks of data in either direction; and

f. retransmitting from each of the transmitting portion to each of the opposite receiving portions only those blocks of data which contained errors as indicated by the identification codes received from the receiving portions.

3,979,720

APPARATUS FOR MONITORING A REDUNDANT MULTI-CHANNEL ANALOG SYSTEM

Daniel Laas, Erlangen; Herrmann Waldmann, Weiher, Landkreis Erlangen, and Josef Wolf, Erlangen-Bruck, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 30, 1975, Ser. No. 572,954

Claims priority, application Germany, May 22, 1974, 2424826

Int. Cl.² G05B *1/02, 23/02*

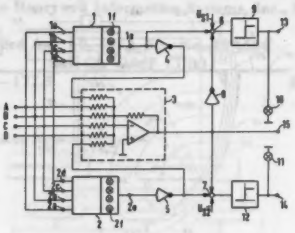
U.S. Cl. 340—146.1 BE **8 Claims**

1. Apparatus for monitoring a redundant multi-channel analog system and for the forming of an undisturbed mean value signal comprising:

a. a maximum value selection device having as inputs all redundant channels and providing an output corresponding to the input channel having the maximum value;

b. a minimum value selection device having as inputs all redundant channels and providing output corresponding to the channel having the minimum value;

c. first and second means for respectively inverting the outputs of said minimum value selection device and said maximum value selection device;



d. a mean value former having as inputs all of said redundant channels and the outputs of said first and second means, said mean value former including means to add all of said input signals and to divide the result by a number which is two less than the number of redundant channels.

3,979,721

PULSE CODE MODULATION RECORDING AND REPRODUCING APPARATUS

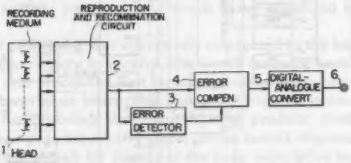
Masuo Umemoto, Tokyo; Koukichi Tomatsuri, Yokohama, and Yasunori Kanazawa, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 21, 1975, Ser. No. 560,882

Claims priority, application Japan, Apr. 1, 1974, 49-35648

Int. Cl.² G11B *27/36*; H03K *5/18*

U.S. Cl. 340—146.1 F **4 Claims**



1. A PCM recording and reproducing apparatus in which pulse coded information is recorded on a recording medium in a frame distribution system, comprising:

a. a recording medium having a plurality of tracks along which the pulse coded information is recorded in the frame distribution system;

b. a plurality of heads to be confronted with said corresponding tracks;

c. a recombination circuit for rearranging the output signals from said respective heads into the time serial fashion of the signal;

d. an error detecting circuit for detecting a frame including at least one word having an error in the output signal of said recombination circuit;

e. a compensating circuit for compensating the output signal from said recombination circuit by the use of the output signal of said error detecting circuit, and

f. a digital to analogue converter for converting the compensated output signal of said recombination circuit into an analogue signal.

3,979,722

AUTOMATIC CHARACTER RECOGNITION DEVICE EMPLOYING DYNAMIC PROGRAMMING

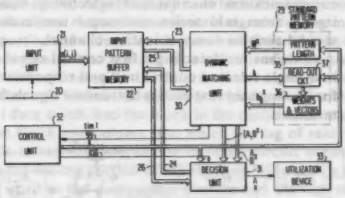
Hiroaki Sakoe, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed May 30, 1975, Ser. No. 582,520

Claims priority, application Japan, May 31, 1974, 49-62240; Sept. 9, 1974, 49-104174

Int. Cl.² G06K *9/00*

U.S. Cl. 340—146.3 AE **8 Claims**



1. A device for automatically recognizing an input pattern of one of a predetermined number of sorts by comparing said input pattern successively with standard patterns of at least said predetermined number of sorts, said input pattern being specifiable by two-dimensional array of meshes of different optical characteristics, each of said standard patterns being given by a series of fundamental vectors, which comprises:

an input pattern buffer memory means for memorizing input electric signals representative of said optical characteristics;

a standard pattern memory means for memorizing standard electric signals representative of the directions and predetermined minima and maxima of magnitudes of vectors of the standard patterns;

a dynamic matching means responsive to said input and standard electric signals for finding an extremum of degrees of coincidence between said input pattern and a plurality of line patterns derived from each of said standard patterns by varying the magnitudes between the predetermined minima and maxima to produce first electric signals representative of similarity measures defined by the extremum degrees of coincidence between said input pattern and the line patterns derived from the respective standard patterns and second electric signals representative of specific line patterns for which said extremum degrees of coincidence are found; and

a decision means comprising, in turn, first means for memorizing feature electric signals representative of a predetermined feature common to the line patterns derivable from each of said standard patterns, second means for comparing said first signals with one another, third means responsive to said input, second, and feature electric signals for judging whether or not said input pattern has said predetermined feature, and fourth means responsive to results of the comparison and judgement carried out by said second and third means for producing an output electric signal representative of a result of recognition of said input pattern.

3,979,723

DIGITAL DATA COMMUNICATION NETWORK AND CONTROL SYSTEM THEREFOR

David Robert Hughes, and Alexander Polischuk-Sawtschenko, both of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1975, Ser. No. 626,802

Int. Cl.² H04Q *9/00*; H04L *5/14*; H04J *3/06*; H04L *5/16*

U.S. Cl. 340—147 R **6 Claims**

1. A communications network for providing half-duplex data communication between a central control station and a plurality of groups of remote terminal stations comprising:

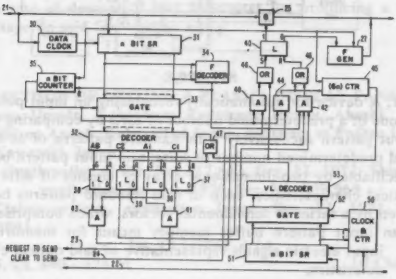
a first simplex communication channel connected to said central station for receiving and conveying signals therefrom;

a second simplex communication connected to said central station for conveying signals thereto;

a plurality of remote control units, one for each of said groups connected in parallel to said first and second simplex communications channels and to a plurality of serially connected terminals and comprising;

first means for receiving signals from said first simplex communication channel and selectively transmitting signals from said series connected terminals to said second simplex communication channel,

second means for detecting a first control signal directed to a single selected control unit and responsive thereto for causing said first means to transmit signals from said terminals,



third means responsive to the received signals from the central station for detecting a general address recognizable by all devices connected to said network,

fourth means responsive to the received signals from the central station for detecting a second control signal,

fifth means responsive to said second and fourth means when a remote control unit is selected for interrupting the signal path between said first means and the series connected terminals and transmitting predetermined signals to said terminals during a first predetermined period of time, and

sixth means responsive to said third means when a remote control unit is not selected for interrupting the signal path between the first means and the series connected terminals and transmitting said predetermined signals to said series connected terminals during a second predetermined period of time.

3,979,724

SEISMIC METHOD FOR DETERMINING THE POSITION OF THE BOTTOM OF A LONG PIPE IN A DEEP BOREHOLE

Daniel Silverman, 5969 S. Birmingham, and John R. Bailey, 3169 E. 38 Place, both of Tulsa, Okla. 74105

Filed June 3, 1974, Ser. No. 475,581

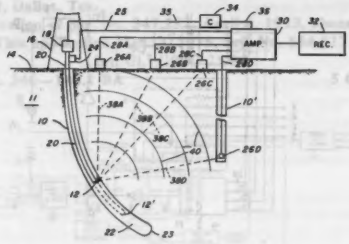
Int. Cl.[2] G01V 1/40

U.S. Cl. 340—15.5 BH **16 Claims**

1. The method of determining the position in the earth of the bottom of a drill pipe in a deep borehole, the length of the drill pipe being known, said drill pipe is filled and borehole at least partially filled with liquid;

a. placing a plurality of geophones in the earth in known positions in a selected multi-dimensional array with respect to the expected position of said bottom of said drill pipe, said geophones adapted to detect and transduce seismic waves in the earth to corresponding electrical signals, and amplifying and recording said transduced signals;

b. near the surface of the earth generating a shock wave in said liquid filled drill pipe and determining the time of generation, whereby said shock wave will travel down to the bottom of said drill pipe and will expand into the liquid in the bottom of said borehole and into the earth in the form of an expanding seismic wave;



c. recording as a function of time the said amplified transduced signals and determining the times of arrival of said seismic wave at each of said plurality of geophones and

d. determining the position of said bottom of said drill pipe.

3,979,725

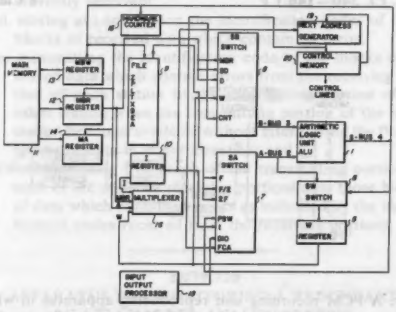
MULTI-WAY PROGRAM BRANCHING CIRCUITS

Charles P. Disparte; Warren L. Hall, Jr., both of Palos Verdes Peninsula; Kenneth N. Isaac, Tustin, and C. Howard Mock, Palos Verdes Peninsula, all of Calif., assignors to Xerox Corporation, Rochester, N.Y.

Filed Aug. 6, 1973, Ser. No. 385,949

Int. Cl.[2] G06F 9/00

U.S. Cl. 340—172.5 **13 Claims**



1. In a digital computer controlled by a program stored in main memory, apparatus for providing multi-way branching comprising:

a plurality of addressable devices for storing random main memory location addresses,

logic means coupled to said devices and controlled by said program for selecting and enabling one of said plurality of devices,

a data register loaded under program control with a data field, the bits of said data field being coupled from the output lines of said data register to said plurality of devices for addressing said devices, and

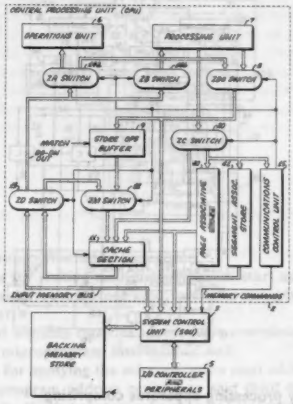
branch means under control of said program and coupled to said main memory location address output of said enabled device for forcing a program branch to the main memory location thus selected.

3,979,726

APPARATUS FOR SELECTIVELY CLEARING A CACHE STORE IN A PROCESSOR HAVING SEGMENTATION AND PAGING

Ronald Edwin Lange, Phoenix; Riley H. Dobberstein, Scottsdale, both of Ariz., and Steven Hugh Webber, Groton, Mass., assignors to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed Apr. 10, 1974, Ser. No. 459,504
Int. Cl.² G06F 13/00
U.S. Cl. 340—172.5 **8 Claims**



1. In a virtual memory data processing system including a backing memory store into which data words of k bits can be written and subsequently read, the absolute address of a data word being its actual address in the backing store, the data words being arranged into pages of not more than *j* data words per page, and the pages of data words being organized into segments;

a central processing unit operatively connected to the backing memory store to receive data words from the backing store, said processing unit including means responsive to the receipt of an instruction data word from the memory store for decoding the instruction to produce control signals; a page associative store; circuit means responsive to control signals for storing in the page associative store the base address of each page of data words stored in the backing memory store; a segment associative store; circuit means responsive to control signals for storing in the segment associative store the address in the page associative store of the base address of each segment stored in the backing store; circuit means responsive to control signals for applying a given page and a given segment address to the page and segment associative stores; said page and segment associative stores responsive to a given page and a given segment address being applied to them respectively producing the base address in the backing memory store of the page designated by the given segment and page address; a communication control unit; circuit means for applying control signals, the base address of a page from the page associative store, and a relative address of a data word in the page to the communication control unit; said unit in response thereto producing the absolute address of the data word in the backing store;

a cache section in said central processing unit; said cache section including a set associative tag directory having storage elements; the storage elements of said tag directory being organized into *n* columns with each column having *m* blocks, said tag directory adapted to store in each block the tag portion of the absolute addresses of *i* data words; a cache store, said cache store having storage elements, said storage elements being organized into *m* times *n* blocks, each block of the cache store being mapped to a block of the tag directory; each block of the cache store adapted to store *i* data words, the high order portion of the absolute addresses of the *i* data words being the tag, the intermediate order portion being the column number of the tag directory in which the tag is stored; circuit means responsive to control signals for storing the tag portion of *i* data words received from the backing memory store into a block in a column of the tag directory corresponding to the intermediate order portion of the absolute address of said *i* data words, and for storing said *i* data words into the block in the cache store mapped to the block and column into which the tag of said *i* data words is stored; comparator circuits, circuit means for applying the tag portion of the absolute address of a given data word to the comparator circuits and the tags stored in the blocks of the column corresponding to the intermediate order portion of said given word, said comparator circuits producing a comparison signal if the tag of said given word is identical to a tag stored in a block in the corresponding column of the directory; said comparison signal signifying that the given data word is stored in the block in the cache store mapped to the block in the tag directory storing the identical tag; and if no comparison signal is produced the given data word is not stored in the cache store; the improvements comprising:

n addressable storage units; one storage unit associated with each of the *n* columns of the tag directory; each of said storage units having storage elements, each storage element having two states, *p* storage elements for storing *p* pointer signals where *p* is defined by the equation, $2^p=m$, the pointer signals stored in a storage unit designating the block in the corresponding column of the tag directory into which a tag is to be written, and *m* storage elements for storing full/empty status signals, one for each block of the corresponding column of the tag directory, each of said *m* storage elements denoting in the second of its two states that a tag is stored in the corresponding block of the tag directory and that data words having an absolute address the higher order bits of which are the tag and the intermediate order of bits the column number in which the tag is stored, are stored in the corresponding block in the cache store, and in its first stage that a tag is not so stored;

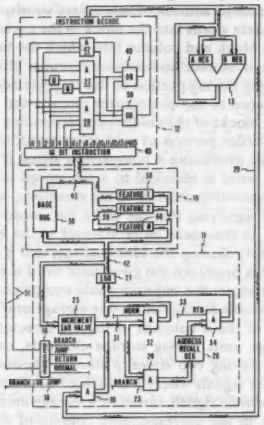
a binary counter circuit for incrementing by one pointer signal applied to it, circuit means for applying the pointer signals of the addressable storage unit to the binary counter circuit responsive to a tag being written into a block designated by the pointer signals in the column of the tag directory with which an addressable storage unit is associated;

circuit means for applying the incremented pointer signals to the associated storage unit for storage by the pointer signal storage elements; circuit means responsive to a tag being written into a block in a column of the tag directory for placing the corresponding storage element of status signals of the corresponding addressable storage unit into its second state; and circuit means responsive to a clear associative memory page control signal from the means for decoding an instruction and the tag portion of the absolute address of the page to be cleared being applied to said circuit means for causing the tag directory to compare the tag stored in each block of the tag directory with the tag of the page to be cleared and for placing all storage elements of status signals of the addressable storage units whose tags are identical with the tag of the page to be cleared into their first state, whereby all data words of a given page stored in the cache store are effectively cleared from the cache store.

3,979,727
MEMORY ACCESS CONTROL CIRCUIT

Brittain Norman Catron; Eugene Francis Dumstorff; Phillip Christian Schloss, and Larry Lloyd Schroeder, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 267,731, June 29, 1972, abandoned. This application Sept. 7, 1973, Ser. No. 395,335
Claims priority, application Canada, Apr. 24, 1973, 170059
Int. Cl.² G06F 9/20, 9/16, 11/12
U.S. Cl. 340—172.5 2 Claims



1. A microprogrammed processor for a data handling device including a read only control store and an execution register for receiving and storing the output of said control store in response to an address and comprising:

address means including an instruction address register connected to said control store for supplying an address to said control store and including next address identifying means for identifying the next address to be gated to said instruction address register,

said next address identifying means including means for incrementing the current address and means for storing such incremented address upon command in an address recall register, said next address identifying means further including means for gating to said address register said incremented address stored during a prior processor instruction cycle,

said next address identifying means further including decode means operatively connected to the output of said execution register for selecting the next address to be gated to said instruction address register from the group including the said incremented current address, a new address, and said prior stored incremented address,

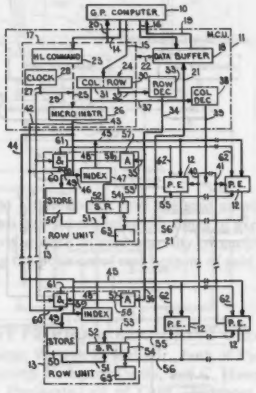
logic means connected to the output of predetermined bit positions of said execution register for determining the next address operation and outputting a binary signal indicative of such operation,

said logic means including circuit means connected to the output of said execution register to cause an output from said circuit means indicative of zero logic levels at all execution register bit positions to override the output of said logic means and produce a signal at the output of said logic means indicative of the operation which gates said prior stored incremented address to the instruction address register.

3,979,728
ARRAY PROCESSORS

Stewart Fiddian Reddaway, Baldock, England, assignor to International Computers Limited, Stevenage, England

Filed Apr. 1, 1974, Ser. No. 456,829
Claims priority, application United Kingdom, Apr. 13, 1973, 17809/73
Int. Cl.² G06F 15/16
U.S. Cl. 340—172.5 15 Claims



1. Array processing apparatus comprising:

a general purpose sequential computer;

an array of interconnected processing elements each having:

a multi-bit memory the individual bits of which are independently addressable,

an arithmetic unit, connected to said multi-bit memory, which unit has at least two separate single-bit input channels, at least one single-bit output channel and arithmetic means for performing a binary operation on separate single bits input one by each of the said channels and outputting a bit representing the result of the said operation on the said output channel, and

input means for receiving micro commands for controlling the operation of a processing element; and

main control means for controlling the mode of operation of the processing elements and the operations performed by said processing elements including: means for receiving high-level instructions from the general-purpose sequential computer, a writable microprogram storage means,

means for retrieving a sequence of microinstructions from a microprogram held in said writable storage means,

means for deriving a plurality of microcommands from each retrieved microinstruction, and

distribution means for distributing to the input means of each processing element at least some of the microcommands derived by the control means.

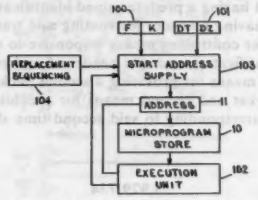
3,979,729
MICROPROGRAM UNIT FOR A DATA PROCESSOR

John Richard Eaton, 14, Sandown Road, Haslingden, Lancashire, and Derek William Ashcroft, 10, Sandown Drive, Sale, Cheshire, both of England

Filed July 12, 1974, Ser. No. 488,091
Claims priority, application United Kingdom, July 18, 1973, 34216/73
Int. Cl.² G06F 9/16
U.S. Cl. 340—172.5 3 Claims

1. A microprogram unit for a data processor, comprising:

a. an instruction register for receiving an input instruction;
b. a first writable random access store containing a plurality of values;
c. means for applying the instruction in said instruction register to said first store to address the first store to read out one of said values therefrom;
d. a second writable random access store containing a plurality of microprogram start addresses;
e. means for applying said value read from the first store and which value represents an address in said second store to said second store to address the second store to read out one of said microprogram start addresses therefrom;



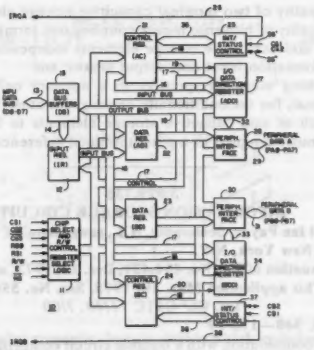
f. a microprogram address register;
g. means for writing said microprogram start address read from said second store into said microprogram address register;
h. a third writable random access store containing a plurality of microprogram instructions; and
i. means for applying the microprogram start address in said microprogram address register to said third store to address the third store to read out one of said microprogram instructions therefrom.

3,979,730

INTERFACE ADAPTOR HAVING CONTROL REGISTER

Thomas H. Bennett, Scottsdale; Earl F. Carlow, Scottsdale, and Michael F. Wiles, Phoenix, all of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Oct. 30, 1974, Ser. No. 519,131
Int. Cl.² G06F *3/00*
U.S. Cl. 340—172.5 **12 Claims**



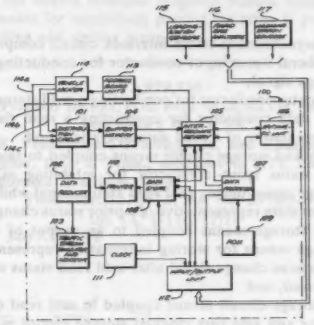
1. In an interface circuit coupled to a data bus and a peripheral data bus, said data bus and said peripheral data bus being bidirectional, circuitry comprising control register means coupled to said data bus and said peripheral data bus for controlling, under program control by a separate processor, a direction of data on a conductor of said peripheral data bus irrespectively of a direction of data on another conductor of said peripheral data bus.

3,979,731

METHOD OF AND SYSTEM FOR RATIONALIZING THE OPERATION OF OPEN-PIT MINES

Nicolay Delchev Naplatanov; Vasil Stoyanov Sgurov; Peter Anguelov Petrov; Zdravko Alexandrov Nicolov; Alexander Ivanov Ganchev, and Stefan Petrov Trendafilov, all of Sofia, Bulgaria, assignors to Institute Po Technicheska Kibernetika pri Ban, Sofia, Bulgaria

Continuation-in-part of Ser. No. 444,704, Feb. 22, 1974, abandoned, which is a continuation of Ser. No. 193,280, Oct. 28, 1971, abandoned. This application Feb. 11, 1975, Ser. No. 549,103
Claims priority, application Bulgaria, Oct. 29, 1970, 15952
Int. Cl.² G06F *7/00*
U.S. Cl. 340—172.5 **10 Claims**

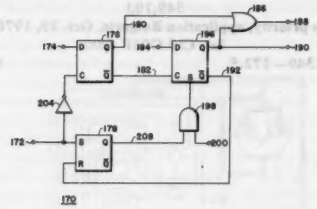


1. A method of rationalizing the operation of an open-pit mine with a plurality of loading stations adjacent respective excavation sites and at least one unloading station at a processing site served by a fleet of vehicles for the transport of excavated material from said loading stations to said unloading station, the excavated material containing high-value and low-value constituents in varying proportions, comprising the steps of
a. establishing production quotas for high-value and low-value constituents to be processed during a predetermined operating period;
b. measuring during said operating period, at each excavation site, the relative proportions of high-value and low-value constituents in the excavated material;
c. classifying said loading stations in a high-yield group and a low-yield group on the basis of the measurements carried out in step (b);
d. continuously calculating during said operating period a first and a second ratio representing the amounts of produced high-value and low-value constituents in proportion to their respective production quotas as established in step (a);
e. comparing said first and second ratios with each other; and
f. routing available vehicles to said loading stations on the basis of the comparison made in step (e), with preference given to the high-yield group upon said second ratio exceeding said first ratio and to the low-yield group upon said first ratio exceeding said second ratio.

3,979,732
ASYNCHRONOUS STATUS INTERLOCK CIRCUIT FOR INTERFACE ADAPTOR

Edward C. Hepworth, Apache Junction, and Rodney J. Means, Tempe, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Feb. 18, 1975, Ser. No. 550,883
Int. Cl.² H03K 5/20, 5/153
U.S. Cl. 340—172.5 **11 Claims**

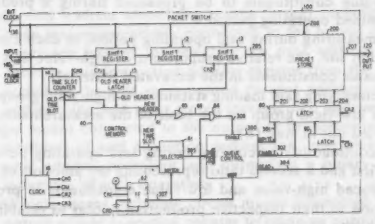


4. An asynchronous status interlock circuit comprising:
a peripheral status input conductor for conducting a status change signal;
a read status conductor for conducting a read status signal;
a read data conductor for conducting a read data signal representative of a read data operation; and
first clocked storage circuit means coupled to said peripheral status input conductor for inhibiting said status change signal during said read status signal while storing a prior state representative of a prior status change signal;
second storage means coupled to an output of said first storage means for storing information representative of said status change signal after said read status signal has occurred; and
third storage circuit means coupled to said read data conductor and said first clocked storage circuit means and said second storage circuit means for storing information indicative of whether said read status signal has occurred conditioned on the event that said second storage means has been reset responsive to said read data signal.

3,979,733
DIGITAL DATA COMMUNICATIONS SYSTEM PACKET SWITCH

Alexander Gibson Fraser, Bernardsville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 9, 1975, Ser. No. 575,937
Int. Cl.² H04J 3/08, 6/00
U.S. Cl. 340—172.5 **14 Claims**

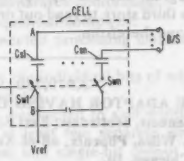


1. In a data communication system, a packet switch for routing a packet of data through said communications system, said packet switch including a packet store having a plurality of queues for storing respective packets of data, and characterized in that said packet switch comprises:
an input terminal adapted for receiving an input frame of data, said input frame including a first plurality of time slots, an input frame time slot having a packet of data;
an output terminal adapted for transmitting an output frame of data, said output frame including a second plurality of time slots, an output frame time slot for inserting a packet of data;
means including a control memory for extending a packet received at said input terminal through said packet store to said output terminal;
said control memory including means for controlling the transfer of a packet from a first time slot of said input frame to a second time slot of said output frame, each time slot having a predetermined identification and each packet having a header for routing said transfer;
said transfer controlling means responsive to said first time slot identification and said header of said packet including first means for providing a second packet header for said packet and second means for providing an output signal corresponding to said second time slot identification.

3,979,734
MULTIPLE EMITTER CHARGE STORAGE MEMORY CELL

Wilbur David Pricer, Burlington, and James Earl Selleck, Middlebury, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 16, 1975, Ser. No. 587,528
Int. Cl.² G11C 11/40
U.S. Cl. 340—173 CA **25 Claims**



1. An information storage system including a plurality of addressable memory cells, each of said memory cells comprising:
a plurality of two terminal capacitive storage elements;
a plurality of bit/sense means coupling one terminal of each of said capacitive storage elements independently to an information input and output means; and
switching means, responsive to a memory cell accessing signal, for unconditionally causing the other terminal of each of said capactive storage elements to be simultaneously coupled to a predetermined reference potential.

3,979,735
INFORMATION STORAGE CIRCUIT

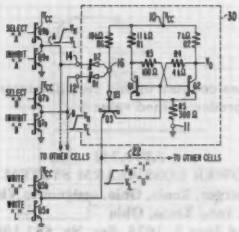
Michael Ian Payne, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 424,421, Dec. 13, 1973, abandoned.
This application Mar. 10, 1975, Ser. No. 556,933
Int. Cl.² G11C 11/40, 7/00
U.S. Cl. 340—173 FF **8 Claims**

1. In combination with a bistable circuit comprising first and second cross-coupled transistors having their collectors connected to a first point of operating potential and having their emitters connected in common to a first node, where the bistable circuit is set to one of two binary conditions by the turn on of two non-saturating transistors having their collector-to-emitter paths connected in series between the base of one of said two cross-coupled transistors and a second point of operating potential, said two non-saturating transistors,

when turned on, clamping the potential between the base of said one cross-coupled transistor and said second point to V_S volts, where V_S is the sum of the minimum collector-to-emitter voltage drops of said two non-saturating transistors, the improvement comprising:

a resistor, connected between a point common to the emitters of said two cross-coupled transistors and said second point of potential for carrying the current that flows through the two cross-coupled transistors and developing a voltage drop (V_R) across said resistor, whereby the



minimum potential that must be applied between the base of said one transistor and said second point to turn on or maintain conduction of said one transistor must equal, or exceed, V_R plus the base-to-emitter voltage drop (V_{BE}) of said one of said two cross-coupled transistors; and wherein the minimum value of said resistor is such that the sum of V_R and V_{BE} is greater than V_S, and the maximum value of said resistor is such that V_R plus the minimum collector-to-emitter voltage drop of either one of said two cross-coupled transistors is equal to, or less than, V_S.

3,979,736

CIRCULAR MAGNETIC DOMAIN DEVICES

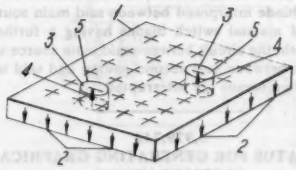
Anthony Marsh, Blisworth, England, assignor to Plessey Handel und Investments A.G., Beeston Nottingham, England

Continuation-in-part of Ser. No. 293,755, Sept. 29, 1973, abandoned. This application July 18, 1974, Ser. No. 489,816

Claims priority, application United Kingdom, Oct. 7, 1971, 46623/71

Int. Cl.² G11C *11/14*

U.S. Cl. 340—174 TF **20 Claims**



1. A circular magnetic domain device which includes a layer of polycrystalline or amorphous uniaxial magnetic material formed on a surface of a substrate, the layer having a single unique easy magnetisation direction substantially normal to a major surface thereof, and crystallites of a diameter that is at least one order of magnitude less than the width of a wall of circular magnetic domains that are to be generated in and caused to propagate in, the layer, the maximum diameter of said crystallites not being greater than 0.01 μm.

3,979,737

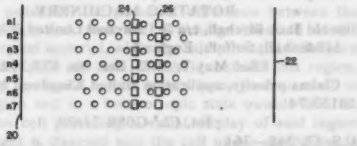
BISTABLE MAGNETIC BUBBLE DOMAIN DEVICES

Aleksander I. Braginski, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 20, 1974, Ser. No. 508,003

Int. Cl.² G11C *11/14, 11/42*

U.S. Cl. 340—174 TF **12 Claims**



1. A device suitable for use in a computer memory or the like comprising a film capable of supporting a densely packed hexagonal array of bistable magnetic bubble domains, writing means for externally altering the state of the individual bubble domains, reading means for sensing and distinguishing the state of the bubble domains, magnetic bubble domain propagating means for repetitively passing the array in proximity to said reading and writing means.

3,979,738

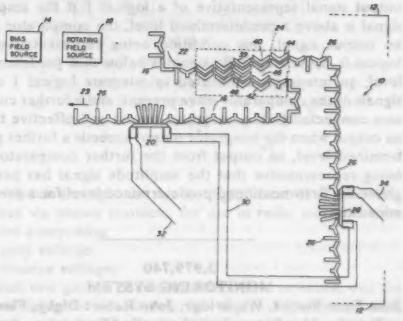
COMPOUND DETECTOR FOR MAGNETIC DOMAIN MEMORY DEVICES

Alfred E. Feuersanger, Framingham, and Charles Brecher, Lexington, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Mar. 12, 1975, Ser. No. 557,854

Int. Cl.² G11C *11/14*

U.S. Cl. 340—174 TF **9 Claims**



3. In a magnetic domain memory device of the type having a magnetic domain sustaining platelet, a bias field source, a domain propagation overlay pattern including a domain propagation track, a rotating magnetic field source, and a first domain detector disposed in the track, an improvement including:

a. domain splitting means, disposed along the propagation track, for splitting each bubble domain entering therein into a pair of domains before the domain reaches the first detector, one of the resulting domains continuing along the propagation track toward the first detector,

b. an auxiliary propagation track extending from the domain splitting means and defining a path for the other domain,

c. a second domain detector disposed along the auxiliary track for detecting the other domain, the difference in time for each of the pair of domains to reach their respective detectors being less than the time for one rotation of the rotating magnetic field, and

d. means for combining the output signal from both detectors to produce an enhanced detector output signal, the combining means including coincidence logic circuitry receiving the detector outputs to enhance the reliability of the domain detectors.

3,979,739
APPARATUS FOR THE DETECTION OF VIBRATION IN ROTATING MACHINERY

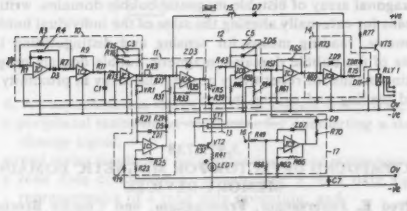
Donald Jack Birchall, c/o D J Birchall Limited, Chiswick Ave., Mildenhall, Suffolk, England

Filed May 7, 1975, Ser. No. 575,312

Claims priority, application United Kingdom, May 7, 1974, 20159/74

Int. Cl.² G08B *21/00*

U.S. Cl. 340—261 **6 Claims**



1. Apparatus for the detection of vibration in rotating machinery, said apparatus comprising means for generating an electrical amplitude signal indicative of the vibration amplitude of a machine under test, a comparator connected to receive the amplitude signal and operative to generate an output signal representative of a logical 1 if the amplitude signal is above a predetermined level, the comparator giving no output signal, this condition being representative of a logical 0, if the amplitude signal is below said predetermined level; an integrator connected to integrate logical 1 output signals of the comparator when present; and a further comparator connected to the integrator output and effective to give an output when the integrator output exceeds a further predetermined level, an output from the further comparator thus being representative that the amplitude signal has persisted above the first-mentioned predetermined level for a predetermined time.

3,979,740
MONITORING SYSTEM

John Egon Forbat, Weybridge; John Robert Digby, Fleet, and Timothy Alan Roper, Guildford, all of England, assignors to Inertia Switch Limited, Hartley Witney, England

Filed June 10, 1974, Ser. No. 477,941

Claims priority, application United Kingdom, Nov. 6, 1973, 27675/73

Int. Cl.² G01D *21/04*; G08B *13/00*

U.S. Cl. 340—276 **36 Claims**

1. A monitoring system comprising:

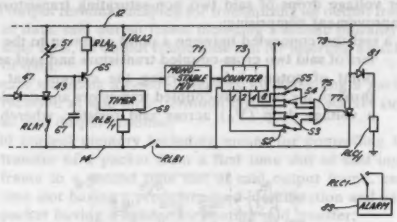
a sensor circuit including at least one set of contacts connected in series between terminal means, said terminal means being connectible to a source of current;

output means connected to the sensor circuit for providing, in use, a first output signal in response to actuation of said set of contacts;

pulse generating means responsive to a said first output signal for providing a first output pulse;

timing means responsive to said first output pulse for timing a counting interval and including means for varying the length of said counting interval; and

counting means actuable by said timing means for counting the output pulses only during said counting interval and for providing a further output signal when the number of



output pulses counted in said counting interval equals or exceeds a predetermined value.

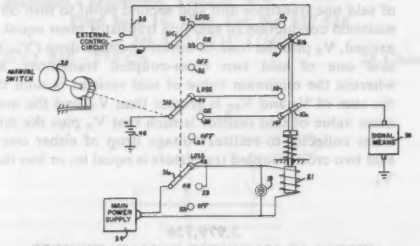
3,979,741
POWER LOSS ALARM SYSTEM

John H. Harshbarger, Xenia, Ohio, assignor to Visual Information Institute, Inc., Xenia, Ohio

Filed June 2, 1975, Ser. No. 583,198

Int. Cl.² G08B *21/00*

U.S. Cl. 340—248 B **6 Claims**



1. In a system for monitoring a main source of electric power; a relay having a coil supplied by the main source of power and having at least one blade, a second source of electric power, a manual switch having at least one blade, each blade having at least two operative positions and closing on respective contacts in said positions, each contact pertaining to the manual switch blade being connected to a respective contact of the relay blade, said second source of power being connected to one of said blades, signalling means having a voltage sensitive control terminal, said terminal being connected to the other of said blades, said manual switch including a second blade interposed between said main source and said coil, said manual switch blades having a further OFF position wherein the circuit between said main source and said relay coil and between said second source and said terminal of said signalling means are interrupted.

3,979,742
APPARATUS FOR GENERATING GRAPHICAL CONFIGURATIONS

Edwin R. Kolb, Chatham Township, N.J., and Robert M. Horvath, Quincy, Ill., assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed Sept. 29, 1972, Ser. No. 293,679

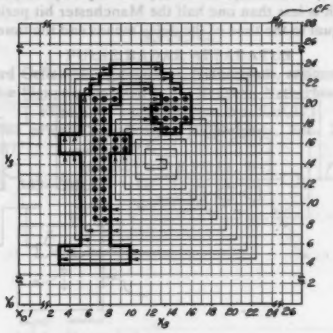
The portion of the term of this patent subsequent to Nov. 7, 1991, has been disclaimed.

Int. Cl.² G06K *15/20*

U.S. Cl. 340—324 AD **12 Claims**

1. Apparatus for forming graphical configurations on an energy responsive surface with an energy beam and comprising: path segment length command means including means for

providing a series of sets coded command signals with each said set of coded command signals defining the length of an associated path segment of a path to be traced on said surface by said beam; beam control means including means for controlling deflection of said beam to trace a nonlinear predetermined scan path on said energy responsive surface from a preselected starting location thereon, said path having at least one portion which at least partially circumscribes a second



portion of said path, said path being comprised of a plurality of successive path segments of length dependent upon associated successive said sets of coded command signals such that alternate ones of said segments are inside and outside of the surface area of a configuration to be formed on said surface, and beam exposure means for alternately blanking and unblanking of said beam such that said beam is blanked while tracing a said outside segment and is unblanked while tracing a said inside segment.

3,979,743

DISPLAYS

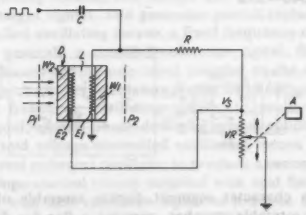
William Thomas Moore, London, England, assignor to The Rank Organisation Limited, London, England

Filed Feb. 20, 1975, Ser. No. 551,420

Claims priority, application United Kingdom, Feb. 20, 1974, 7678/74

Int. Cl.² G01R *13/40*

U.S. Cl. 340—324 R **13 Claims**



1. A display device comprising a liquid crystal cell having two parallel flat transparent cell walls, a liquid crystal material contained between said walls, electrodes disposed inwardly of said cell walls and means for applying a potential difference between said electrodes, the liquid crystal material undergoing transition from the homogeneous state to the homeotropic state when the potential difference applied between said electrodes exceeds a predetermined switching threshold, wherein the improvement consists in

a. an alternating current source,

b. means to said alternating current source for applying an alternating voltage along one of said electrodes to establish an alternating potential gradient along said electrode,

c. a potentiometric device connected to said alternating current source and to the other electrode to apply thereto a variable alternating potential intermediate the extremes of the potential gradient applied to said one electrode, such that,

d. at a region within the cell dependent upon the magnitude of said potential, the potential difference between the electrodes is less than the switching threshold of the liquid crystal material, while the said potential difference is greater than the said threshold outside this region, whereby the liquid crystal is in a homogeneous state in said region and in a homeotropic state outside said region, the cell providing a visual display of said region when light is directed into the cell under conditions in which the emergent light is modified in dependence upon the state of the liquid crystal.

3,979,744

CIRCUIT ARRANGEMENT FOR THE DIGITAL CONTROL OF OPERATING FUNCTIONS VIA SENSOR ELECTRODES, ESPECIALLY IN RADIO AND TELEVISION RECEIVERS

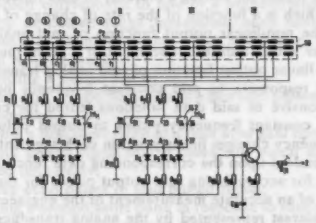
Wolfgang Schroder, Pforzheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 13, 1974, Ser. No. 497,169

Claims priority, application Germany, Sept. 14, 1973, 2346293

Int. Cl.² H04Q *3/42*

U.S. Cl. 340—324 R **12 Claims**



1. A circuit arrangement for the digital control of operating functions via sensor contacts, for use in radio and television receivers comprising:

a supply voltage;

a reference voltage;

at least two groups of bistable electronic switches, one for fine adjustment and one for coarse adjustment, each group having a first output capable of being coupled to said reference voltage via a first input associated only with said output, each of said groups having a common control input;

first and second resistors coupled to the second input of said at least two groups, the voltage drop across said first and second resistors caused by a transient current in one of the bistable switches whereby the outputs of all other switches are disconnected from said reference voltage;

a plurality of resistors coupled at one end to the outputs of the bistable switches in said at least two groups and coupled at their output to a common point;

a plurality of decoupling diodes, each coupled between the output of a bistable switch and one of said plurality of resistors; and

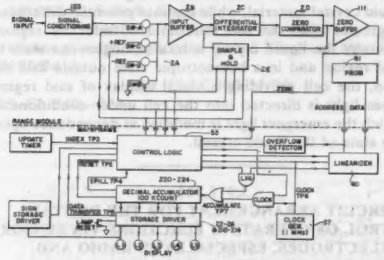
a sensor control panel comprising sensor electrodes coupled to the input terminals of the bistable switches, said sensor electrodes divided into groups wherein the sensor electrodes occupying the same position in each group are coupled together.

3,979,745

SYSTEM AND METHOD FOR LINEARIZING ANALOG MEASUREMENTS DURING ANALOG-TO-DIGITAL CONVERSION

Allen J. Bishop, Fort Worth, Tex., assignor to Westronics, Inc., Fort Worth, Tex.

Filed Feb. 22, 1974, Ser. No. 444,953
Int. Cl.² H03K 13/02
U.S. Cl. 340—347 NT 8 Claims



1. Apparatus for producing an accurate measurement of the engineering units of interest represented by the output signal of an analog transducer having a non-linear output function, comprising:

an analog-to-digital converter for producing a digital output comprising a quantity of constant frequency pulses representative of the magnitude of the output signal of said analog transducer,

storage means for storing a plurality of data functions, each of which is a function of the rate of change of the slope of the non-linear output function of said analog transducer within a different segment of a given range of the non-linear output function of said analog transducer,

means responsive to said constant frequency pulses and responsive to said data functions stored for converting said constant frequency pulses to output pulses whose frequency changes linearly within each segment at a rate dependent upon the corresponding data function, and

means for accumulating said output pulses for the production of an accurate measurement of the engineering units of interest represented by the analog transducer output signal.

3,979,746

HIGH-SPEED MANCHESTER CODE DEMODULATOR

Bobby R. Jarrett, Fredericksburg, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 28, 1975, Ser. No. 573,222
Int. Cl.² H03K 13/00; G11B 5/09
U.S. Cl. 340—347 DD 1 Claim

1. A demodulator for decoding the Manchester code at bit rates approaching one gigahertz comprising:

a high speed transition marker which receives the Manchester code and generates a pulse representative of the detected zero crossings of both information and phase bits of the Manchester data comprising:

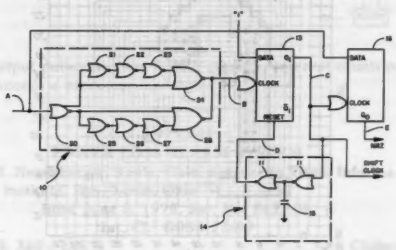
a first NOR logic gate receiving at an input thereof the Manchester code and generating at outputs thereof an OR output and a NOR output; means to delay and invert the NOR output of said first gate;

a second NOR gate receiving at an input thereof the NOR output of said first gate, at another input the delayed and inverted NOR output of said first gate; means to delay and invert the OR output of said first gate;

a third NOR gate receiving at one input the OR output of said first gate and at another input the delayed and inverted OR output of said first gate; and a wire-ORed connection of said outputs of said second and third NOR gates;

a high speed edge triggered flip-flop having a clock input, a reset input which overrides the clock input, an ouput and data inputs wired such that when the output signal of said transition marker is presented to the clock input of the flip-flop, the flip-flop is triggered and the output goes high or stays high unless locked out by the reset;

time delay means connected between said flip-flop ouput and said reset input whereby the flip-flop output pulse width is less than one half the Manchester bit period and is equal to the time of the delay means and the time of the propagation delay from the reset to the output of said flip-flop, and whereby the flip-flop output down time is equal to the time of the delay means and the time of the propagation delay from the reset to the output and the time of the propagation delay from the clock to the output of said flip-flop and the time till the next clock input pulse, and whereby the reset input is held high by the flip-flop output at the point in time corresponding to the occurrence of the phase pulses of the transition marker thereby locking out said phase clock input pulses; and



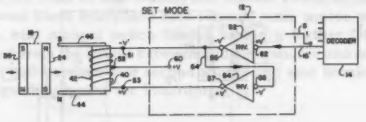
means to strobe the Manchester code input with the output of said flip-flop such that a conversion from Manchester to NRZ is obtained.

3,979,747

CONTROL CIRCUIT FOR A CHARACTER SEGMENT DISPLAY ASSEMBLY

Domenic Candida, Massapequa, N.Y., assignor to Vernitron Corporation, Great Neck, N.Y.

Filed June 2, 1975, Ser. No. 583,026
Int. Cl.² G08B 5/00
U.S. Cl. 340—373 7 Claims



1. In a character segment display assembly of the type having a rotatable member, carrying a flag for display at a window of a stationary mask said rotating member having a bipolar permanent magnet with an N and an S pole spaced apart and a stationary electromagnetic coil wound on a magnetic core and disposed in fixed position adjacent said rotating member, said core having a pair of spaced magnetizable members defining magnetic poles of opposite polarity whereby electrical energization of said coil will polarize said magnetic poles of said core to attract one of said permanently magnetized poles of said rotatable member; the improvement which comprises:

said coil comprising a bifilar winding having a center tap;

a source of constant positive voltage connected to said center tap;

a first voltage invertor having an output connected to one end of said coil and an input arranged to receive signal voltage pulses; and

a second voltage invertor having an output connected to the other end of said coil and an input connected to the output of said first invertor.

3,979,748

PULSE RADAR APPARATUS

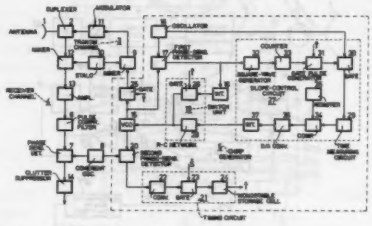
Bernard Gellekink, Ootmarsum, Netherlands, assignor to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Feb. 14, 1975, Ser. No. 549,771

Claims priority, application Netherlands, Feb. 28, 1974, 7402687

Int. Cl.² G01S 9/233, 9/42

U.S. Cl. 343—7.7 **2 Claims**



1. A pulse radar apparatus comprising, in the transmitter signal channel, a generator circuit to generate linear F.M. pulses of relatively long duration, and, in the receiver signal channel, means to compress radar return signals into output pulses of relatively short duration, means for phase detecting said short output pulses, a coherent oscillator controlling said phase detecting means, and means for the elimination of stationarytarget signals, said generator circuit including voltage controlled oscillating means, a fixed frequency oscillating means to generate a constant reference signal, first phase detecting means having one input coupled to the output of said voltage-controller oscillating means and another input to said fixed frequency oscillating means, to produce a first control signal; second phase detecting means coupled to the output of said voltage-controlled oscillating means and controlled by said coherent oscillator to produce a second control signal; a slope-control circuit supplied with said first control signal and with said reference signal to produce an output signal which is determined by the length of a period for generating a given number of periodic variations of said first control signal during the time interval when the second control signal exceeds a predetermined value; a timing circuit controlled by said second control signal and having means to produce a timing signal during the time interval when the second control signal exceeds the predetermined value, and switching means which, in the absence of said timing signal, apply said first control voltage to the input of said voltage controlled oscillating means and, in the presence of said timing signal, gradually replace the first control voltage with the output signal from the slope control circuit.

3,979,749

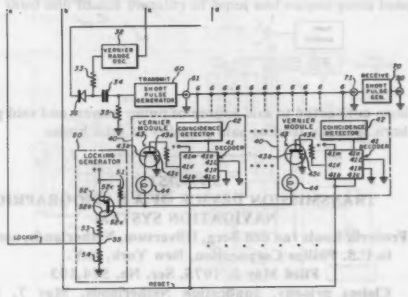
RANGE READOUT APPARATUS

Gerald F. Ross, Lexington, and Kenneth W. Robbins, Wilmington, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,317

Int. Cl.² G01S 9/06

U.S. Cl. 343—13 R **13 Claims**



13. A method of measuring range comprising the steps of:

establishing a multiplicity of incremental time delays, each of which corresponds to one of a predetermined multiplicity of coarse range increments each having equal coarse range intervals within which a fine range measurement is to be made;

transmitting a pulsed signal;

selecting one of said time delays when said pulsed signal is transmitted;

triggering a first short pulse at a time after said transmission of said pulsed signal that is essentially equal to said selected time delay;

receiving echo pulses of said pulsed signal;

triggering a second short pulse in response to said reception of each of said echo pulses;

coupling said first and second short pulses to opposite ends of a transmission line the electrical length of which is essentially equal to a coarse range increment and containing taps with electrical spacing therebetween corresponding to a fine range increment; and

determining the fine range increment within said coarse range increment for said selected coarse range interval by noting the tap on said transmission line at which said first and second short pulses coalesce.

3,979,750

OPTICAL PUMP POWER DISTRIBUTION FEED

Bob L. Smith, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

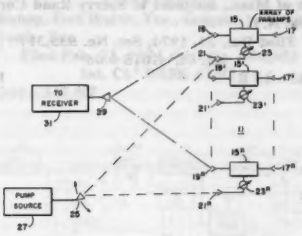
Filed June 20, 1975, Ser. No. 588,917

Int. Cl.³ H04B 7/00

U.S. Cl. 343—100 SA **4 Claims**

1. A system comprising a plurality of receiver antenna elements in an array; a plurality of parametric amplifiers each having an input terminal, output terminal and a pump feed terminal; a source of pump power being connected to said pump feed terminals; said plurality of receiver array antenna elements being connected to said input terminals; said source of pump power having its phase input to the pump feed terminals changeable so as to cause steering of the output of the

parametric amplifiers; a plurality of pump feed horns having their outputs connected to the pump feed terminals; a pump



horn connected to said source of pump power; and said pump horn spatially feeding said plurality of feed horns.

3,979,751

TRANSMISSION DEVICE OF A RADIOGRAPHIC NAVIGATION SYSTEM

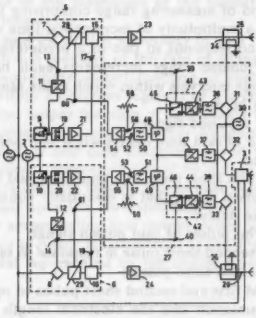
Frederik Louis van den Berg, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 2, 1975, Ser. No. 574,103

Claims priority, application Netherlands, May 7, 1974, 7406082

Int. Cl.[2] G01S 1/44

U.S. Cl. 343—106 R **5 Claims**



1. A transmission device of a radiographic navigation system for azimuth determination, in which the transmission device generates a rotating directional beam pattern and a static, omnidirectional phase reference beam pattern, comprising a carrier wave generator and a modulation signal generator, two double sideband modulators which are connected to the two generators and which serve to generate, for the benefit of the rotating directional beam pattern, two double sideband signals having a modulation which is phase-shifted 90° with respect to each other and a suppressed carrier wave, two transistorized power amplifiers, each of which is coupled to one of the modulators, and a phase reference signal generator which is coupled to the carrier wave generator and the modulation signal generator for generating a phase reference signal for the benefit of the static beam pattern, a phase comparison device including a mixing signal generator and three mixing devices which are coupled thereto, each mixing device being coupled to an output of the power amplifiers and the phase reference signal generator for transposing the carrier wave frequencies of the double sideband signals and the phase reference signal to a lower frequency, two modulation eliminators which are provided with control inputs and each of which is coupled to an output of the mixing devices which supply the frequency-transposed double sideband signals, the control inputs being coupled to the modulation signal generator for eliminating the frequency-transposed double sideband signals, and two phase discriminators, each of which is coupled to one of the modulation eliminators, both phase discriminators being coupled, via a modulation eliminator, to the mixing device which supplies the frequency-transposed phase reference signal, and two phase shifters which have control inputs and which are each included in one of the signal paths of the double sideband signals, the control inputs being coupled to the phase discriminators for controlling the phase of the double sideband signals under the control of control signal supplied by the phase discriminators.

3,979,752

PULSE-TYPE RADAR WITH MODULATED CARRIER FREQUENCY

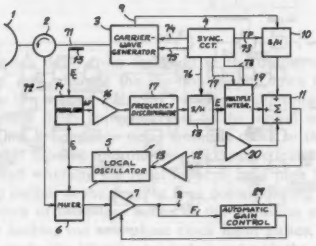
Jean-Claude Chariot, Paris, France, assignor to Thomson-CSF, Paris, France

Filed July 11, 1975, Ser. No. 595,083

Claims priority, application France, July 12, 1974, 74.24365

Int. Cl.[2] G01S 9/23

U.S. Cl. 343—17.2 R **10 Claims**



1. In a radar system, in combination:

a generator of periodic bursts of carrier frequency separated by pulse periods of predetermined duration, said generator having an outgoing channel for the transmission of said bursts of carrier frequency;

frequency-varying means in said generator for changing said carrier frequency from one pulse period to the next;

an incoming channel for the reception of echoes of said carrier frequency reflected by a target;

synchronizing means connected to said frequency-varying means for establishing a repetitive modulation pattern for said carrier frequency having a whole number of repetition periods in a program cycle of n pulse periods;

a local oscillator having an operating frequency variable in a range offset from the range of said carrier frequencies by a predetermined intermediate frequency, said incoming channel including mixer means connected to said local oscillator for heterodyning said operating frequency with received echoes to produce an output signal of said intermediate frequency for delivery to a utilization circuit;

modulating means with input connections to said outgoing channel and to said local oscillator for deriving a difference frequency from said operating frequency and said carrier frequency;

discriminating means connected to said modulating means for converting said difference frequency into a feedback signal having a predetermined mean value upon said difference frequency equaling said intermediate frequency;

multiple integrating means connected to said discriminating means for simultaneously storing feedback signals from different pulse periods over a plurality of program cycles; and

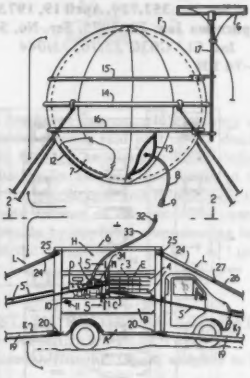
control means for said local oscillator connected to said multiple integrating means for individually changing said operating frequency during each pulse period according to the stored feedback signal thereof to make said difference frequency substantially equal to said intermediate frequency.

3,979,753

PORTABLE BALLOON ANTENNA SUPPORT STRUCTURE

Lawrence E. Underwood, 24296 Hesperian Blvd., Hayward, Calif. 94545

Filed Apr. 11, 1975, Ser. No. 567,095
Int. Cl.² H01Q 1/28
U.S. Cl. 343—706 **4 Claims**



1. In combination:
a. a vehicle movable over the ground;
b. a storage tank in the vehicle for holding a lighter than air gas under compression;
c. a compartment in the vehicle for holding a balloon when deflated;
d. a winch in the vehicle and carrying a plurality of drums with guy lines leading from the drums and attached to the balloon, the balloon having a tube connectible to a valve-controlled outlet for said storage tank for feeding the compressed gas into the balloon for inflating it; and
e. poles pivotally secured to both sides of the vehicle and swingable from inoperative to operative positions and carrying pulleys at their outer ends around which the guy lines are passed, the poles spacing the pulleys so that the guy lines will hold the inflated balloon in a desired position above the vehicle, the balloon supporting an electron wave receiving device at a desired height.

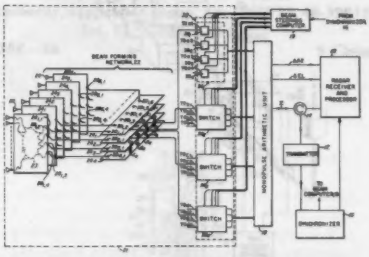
3,979,754

RADIO FREQUENCY ARRAY ANTENNA EMPLOYING STACKED PARALLEL PLATE LENSES

Donald H. Archer, Santa Barbara, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Apr. 11, 1975, Ser. No. 567,330
Int. Cl.² H01Q 3/26
U.S. Cl. 343—754 **2 Claims**

1. An antenna array in a monopulse radar for forming, simultaneously, a desired set of overlapping directional beams, each one of such beams having a substantially circular cross section, such array comprising:
a. a first set of parallel plate radio frequency lenses, each one of such lenses including a first plurality of feedports and a second plurality of output ports, each one of such feedports in each one of such parallel plate radio frequency lenses being coupled through a different electrical path to all of the output ports in the corresponding lens, the lengths of the different electrical paths from each one of the feedports to the output ports being selected to form a first set of overlapping energy distributions corresponding in number to the desired set of directional beams;
b. a second set of parallel plate radio frequency lenses, the number of such lenses in such second set being equal to the number of output ports in each one of the parallel plate lenses in the first set thereof, each one of the parallel plate radio frequency lenses in such second set having a third plurality of input ports equal in number to the number of parallel plate radio frequency lenses in the first set and a fourth plurality of output ports, each one of the third and fourth plurality of input and output ports being



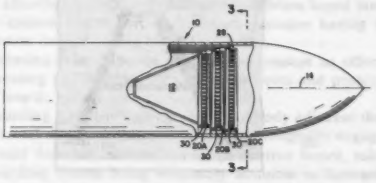
coupled through a different electrical path to form a second set of overlapping energy distributions corresponding in number to the desired set of directional beams;
c. means for interconnecting, through predetermined length paths, one of the output ports in the first set of parallel plate radio frequency lenses to a corresponding one of the input ports in the second set of parallel plate radio frequency lenses; and
d. means for connecting each one of the output ports in the second set of parallel plate radio frequency lenses to a different antenna element.

3,979,755

ROTATING LENS ANTENNA SEEKER-HEAD

Roger W. Sandoz, Fairfield, and Myron M. Rosenthal, Wayne, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 17, 1974, Ser. No. 533,563
Int. Cl.² H01Q 19/08
U.S. Cl. 343—754 **5 Claims**



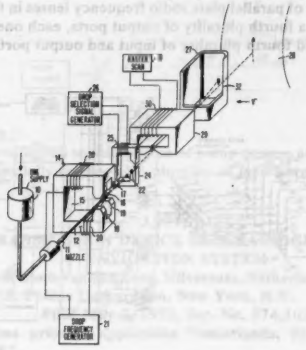
1. In a radar system wherein a beam of microwave energy is transmitted from an antenna through a radome, the improvement comprising: a plurality of rotatable lenses disposed in parallel within said radome between said antenna and said radome for redirecting microwave energy impinging thereon, said plurality of rotatable lenses are first, second, and third wedges disposed in respective parallel planes across the beam path of said antenna with said first wedge being positioned between said second and third wedges, said first wedge being constantly rotatable for providing a conical scan pattern, and said second and third wedges being rotatable to adjustably offset the antenna beam a predetermined distance from the antenna boresight.

3,979,756

METHOD AND APPARATUS FOR MERGING SATELLITES IN AN INK JET PRINTING SYSTEM

Edward F. Helinski, Johnson City, and Jack L. Zable, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1974, Ser. No. 534,043
Int. Cl.² G01D 15/18
U.S. Cl. 346—1 15 Claims



1. In an ink drop forming system of the type having means for supplying magnetic ink under pressure to a nozzle or the like to cause a continuous jet stream of magnetic ink to flow from said nozzle and magnetic transducer means for applying periodic perturbations at plural spaced locations along said stream in advance of drop breakoff, a method of controlling the merging of satellites comprising

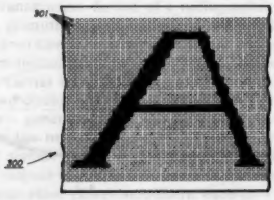
making the spacing between said spaced location different from the wavelength of the perturbations.

3,979,757

ELECTROSTATIC DISPLAY SYSTEM WITH TONER APPLIED TO HEAD

Jack S. Kilby, 7723 Midbury, Dallas, Tex. 75230, and Jay W. Lathrop, 211 Lark Circle, Clemson, S.C. 29631

Division of Ser. No. 352,729, April 19, 1973, abandoned. This application Jan. 15, 1975, Ser. No. 541,239
Int. Cl.² G03G 15/08, 15/04
U.S. Cl. 346—74 ES 48 Claims



1. A system for producing an image of charged particles, comprising in combination:

an imaging head having an array of discretely chargeable electrode areas positioned and charged to receive and attract in an image pattern particles charged opposite the charge on said chargeable electrode areas,

individual circuit means associated with each discretely chargeable electrode area for selectively establishing at least one of two different electrical charges on the respective discretely chargeable electrode areas wherein the interconnections between said circuit means and said electrode areas are buried below the surface defined by said electrode areas so that an effective particle attracting field will be established only at said electrode areas and not by said circuit means,

means for applying directly to the surface of said imaging head a uniformly distributed supply of charged particles which are attracted to the charges on the head to collect in accordance with a non-uniform image pattern for transfer therefrom in said non-uniform image pattern,

means for transferring the particle image from the plates to a surface, and

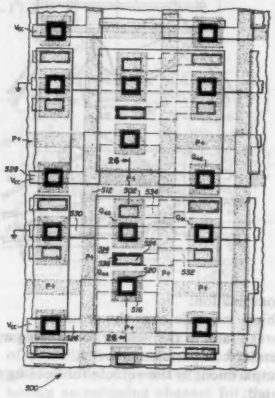
means for fixing the image on the surface.

3,979,758

ELECTROSTATIC HEAD WITH TONER ATTRACTING PLATES

Jack S. Kilby, 7723 Midbury, Dallas, Tex. 75230, and Jay W. Lathrop, 211 Lark Circle, Clemson, S.C. 29631

Continuation of Ser. No. 352,729, April 19, 1973, abandoned. This application Jan. 20, 1975, Ser. No. 542,286
Int. Cl.² G03G 15/16, 15/044
U.S. Cl. 346—74 EH 32 Claims



1. A system for producing an image of charged particles, comprising in combination:

an imaging semiconductor substrate having a two dimensional array of discretely chargeable surface electrode areas in the form of spaced segments and positioned when selectively charged temporarily to receive and attract in an image pattern particles charged opposite the charges on said areas, and

individual circuit means including active devices formed in said substrate electrically remote from said surface but associated with each discretely chargeable electrode area for selectively establishing at least two different electrical charges on the respective discretely chargeable electrode areas.

3,979,759

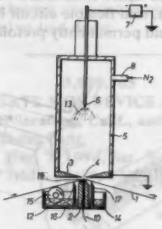
PROCESS AND APPARATUS FOR ELECTROGRAPHIC RECORDING UTILIZING CONTACT LIQUID

Walter Simm, Leverkusen, Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Apr. 29, 1975, Ser. No. 572,932
Claims priority, application Germany, May 14, 1974, 2423245
Int. Cl.² G03G 15/044; G01D 15/06
U.S. Cl. 346—74 ES 11 Claims

1. An electrographic process for the production of charge images on a moving insulating recording strip material, said recording strip material being capable of being charged by a

discharge current produced by a voltage between a corona discharge electrode and a recording electrode, imagewise charging of recording strip material by the action of the corona discharge current while moving across the record electrode, comprising the steps of producing a corona discharge from a discharge electrode, directing part of the corona discharge to a surface of the strip and subjecting the strip to the



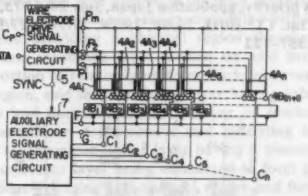
action of the discharge current while moving across the recording electrode, passing said part of the discharge current to said surface through an elongated gap defined by a diaphragm, producing an electric field between the recording electrode and the diaphragm and intensifying the contact of the more remote surface of the recording material and the recording electrode by applying a conducting liquid having a conductivity in the range of 10^{-4} to 10^{-9} ω^{-1} cm^{-1}.

3,979,760

ELECTROSTATIC RECORDING APPARATUS WITH AUXILIARY ELECTRODES

Masaharu Tadauchi, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 4, 1975, Ser. No. 555,280
Claims priority, application Japan, Mar. 6, 1974, 49-25195
Int. Cl.² G03G *15/044*; G01D *15/06*
U.S. Cl. 346—74 EE **3 Claims**



1. An electrostatic recording apparatus comprising:

a wire electrode row including a multiplicity of wire electrodes which are continuously arranged substantially in a row and are divided into a plurality of wire electrode blocks each having the same number of wire electrodes;

a pair of first and second auxiliary electrode rows provided respectively along both sides of and opposite to the wire electrode row, the auxiliary electrodes of the first auxiliary electrode row being arranged in a zigzag form relative to those of the second auxiliary electrode row and each of the auxiliary electrodes having approximately the same length as that of each of the wire electrode blocks;

a driving circuit for simultaneously driving the corresponding same-numbered wire electrodes of the respective wire electrode blocks, the driving of the wire electrodes in each of the wire electrode blocks being carried out in accordance with the numbered order thereof within a respective wire electrode block; and

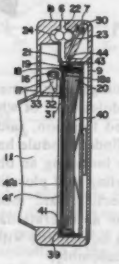
a scanning circuit for scanning a selected auxiliary electrode of one of the first and second auxiliary electrode rows in cooperation with a first selected auxiliary electrode of the other of the first and second auxiliary electrode rows and subsequently in cooperation with a second selected auxiliary electrode of the other of the first and second auxiliary electrode rows.

3,979,761

AUTO-PROCESS CAMERA

Yoshio Asano, Hyogo, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Apr. 5, 1974, Ser. No. 458,361
Claims priority, application Japan, Apr. 5, 1973, 48-39015
Int. Cl.² G03B *17/50*
U.S. Cl. 354—86 **9 Claims**



1. In an auto-process camera having a light-proof chamber for retention of a cassette containing a plurality of film monosheets and a light-proof protective board, in a main camera body, said cassette having a front wall formed with an opening through which a foremost monosheet is exposed, the improvements comprising:

a. a first passage through said main camera body into said chamber for removal of said protective board and film monosheets from said cassette;

b. a second passage through said main camera body into said chamber for reinsertion of said protective board into said cassette, said first and second passages having a common inner opening to said chamber;

c. processing rolls disposed in said first passage to effect processing and removal of said monosheets and protective board;

d. forwarding means in said main camera body adjacent the front wall of said cassette, said means frictionally engaging said foremost monosheet or protective board, said forwarding means being selectably actuable to forward said monosheet or protective board from said cassette to said processing rolls;

e. pushing means in said main camera body adjacent said forwarding means, said pushing means selectably actuable to move said monosheets in said cassette toward the rear thereof; and

f. drive means in said main camera body for driving one of said processing rolls, said forwarding means and said pushing means;

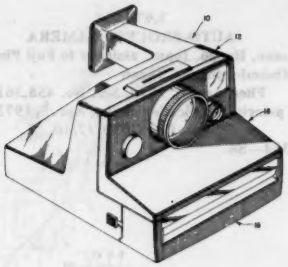
whereby, said protective board may be removed from said cassette to permit exposure of said film monosheets and subsequently reinserted into said cassette while said cassette is still in said main camera body.

3,979,762

MODULAR PHOTOGRAPHIC SYSTEM

Donald H. Hendry, Rockland; Andrew S. Ivester, Charlestown, and Bruce K. Johnson, Andover, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 3, 1975, Ser. No. 554,770
Int. Cl.[2] G03B 17/02
U.S. Cl. 354—288 37 Claims



1. A modular photographic camera comprising:
a plurality of modules each of which is adapted to perform a predetermined function, said plurality of modules including a viewfinder module having an optical axis and a shutter module including an objective lens assembly;
means for supporting said plurality of modules;
means for connecting said modules to said supporting means to define an operational system assembly having an optical axis coincident with the optical axis of said objective lens assembly;
a housing including a plurality of walls defining a chamber having an opening through which said operational system assembly may be inserted into said chamber, said housing including means cooperable with said operational system assembly during its insertion into said chamber for locating and supporting said operational system assembly within said chamber;
closure means connectable to said housing to close said chamber opening and substantially complete the enclosure of said operational system assembly when disposed within said chamber, said closure means including means for receiving and supporting at least part of said viewfinder module such that the optical axis of said viewfinder module is aligned, in part, with the optical axis of said objective lens assembly of said operational system assembly when said closure means is connected to said housing and said operational system assembly is disposed within said chamber; and
means for connecting said closure means to said housing.

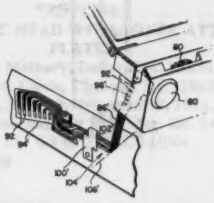
3,979,763

CIRCUIT BOARD ARRANGEMENT FOR COLLAPSIBLE CAMERA APPARATUS

Loring K. Mills, Hampton, N.H., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 5, 1974, Ser. No. 494,472
Int. Cl.[2] G03B 17/04; H02G 15/08
U.S. Cl. 354—187 5 Claims

1. A collapsible camera apparatus comprising:
a first body section having a first substantially planar surface associated therewith;
a second body section having a second substantially planar surface associated therewith;
means for pivotally connecting said first and second body sections such that said first substantially planar surface is disposed for pivotal motion about an axis orthogonal to said second substantially planar surface; and
a flexible circuit board including a flexible substantially planar insulating support member defining spaced apart first and second terminal portions in respective juxtaposed relation with respect to said first and second planar surfaces and interconnected by an elongated portion, said first and second terminal portions respectively including a plurality of spaced apart conductive pads in overlying relation thereto and interconnected respectively by a plurality of spaced apart conductive runs overlying said elongated portion, said flexible circuit board additionally being angularly and permanently prefolded about a single



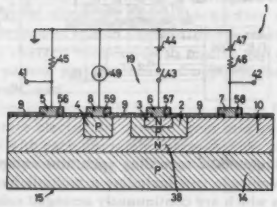
prefold line extending across said elongated portion with that part of said elongated portion extending from said prefold line to said first terminal portion assuming a gradual flexed condition over substantially the entire length thereof so that pivotal movement of the first planar surface about its axis orthogonal to the second planar surface operates to alter said flexed condition in a gradual manner only in the area of said elongated portion intermediate said prefold line and first terminal portion without any substantial flexing taking place about said prefold line.

3,979,764

CONTROLLED FADING SWITCHING CIRCUIT

Michio Arai, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed July 23, 1974, Ser. No. 491,117
Claims priority, application Japan, July 24, 1973, 48-83372
Int. Cl.[2] H01L 29/80, 29/74, 29/747, 27/02
U.S. Cl. 357—22 8 Claims



1. A semiconductor switch comprising a semiconductor channel region of first impurity type having a planar surface and having source and drain regions therein, a gate region of second impurity type extending partially into said channel region from said planar surface between said source and drain regions to form a junction with a portion of said channel region, an auxiliary region of the first impurity type extending partially into said gate region and forming a junction therewith, a gate bias source, a switch connecting said gate bias source to said auxiliary region to forwardly bias the junction between said auxiliary region and said gate region and reversely bias the junction between said gate region and said channel region, whereby when said switch is closed a deple-

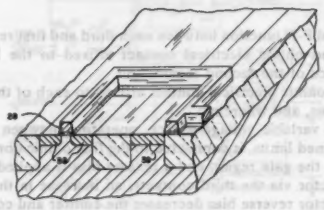
tion region is formed at least partially across said channel region which increases the source to drain resistance, an emitter region of the second impurity type extending partially into said channel region from said planar surface, a current source connected to said emitter region which is poled to cause minority carriers to be injected into said depletion region for neutralizing stored charges therein to decrease the source to drain resistance for effecting a fade time, and a channel region biasing circuit connected between said source and drain regions having an input terminal at said source and an output terminal at said drain.

3,979,765

SILICON GATE MOS DEVICE AND METHOD

Warren L. Brand, Saratoga, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Mar. 7, 1974, Ser. No. 448,893
Int. Cl.² H01L *29/78, 27/02, 29/04, 27/12*
U.S. Cl. 357—23 **9 Claims**



1. In an MOS semiconductor device, a semiconductor body of first conductivity type having a planar surface, said body having spaced grooves therein opening through said surface, insulating material filling said grooves and extending to the planar surface of said body to form in combination with said body surface a continuous planar surface substantially free of physical step heights, spaced source and drain regions of second conductivity type formed in the body and extending to the surface in areas between said grooves filled with insulating material and providing a channel region therebetween, a relatively thin insulating layer formed on said surface and having a portion of relatively uniform thickness overlying the channel region, said thin insulating layer having substantially planar top and bottom surfaces, a layer of semiconductor material formed on a portion of said insulating layer, the bottom of said semiconductor layer having a planar surface, said semiconductor layer being delineated to form gate electrode portions overlying said channel region and further portions providing an interconnecting layer of uniform topography, a protective layer formed on said insulating layer and said layer of semiconductor material, and lead means formed on said protective layer and extending through said protective layer to contact said source and drain regions and said semiconductor layer.

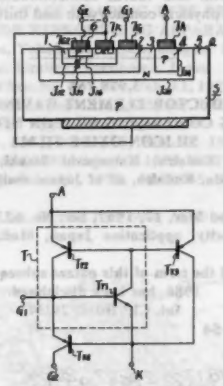
3,979,766

SEMICONDUCTOR DEVICE

Tadaharu Tsuyuki, Isehara, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed June 19, 1974, Ser. No. 480,748
Claims priority, application Japan, June 21, 1973, 48-70069
Int. Cl.² H01L *29/00*
U.S. Cl. 357—37 **4 Claims**

1. A semiconductor device comprising:
a first region of a first conductivity type;
a second region of a second and opposite conductivity type adjacent said first region;
a third region of the first conductivity type adjacent said second region;
a fourth region of the second conductivity type adjacent said third region;
a fifth region of the second conductivity type formed as a substrate surrounding said third region, said third region serving to isolate said fifth region from said second and fourth regions, said fifth region being electrically connected to said first region; and



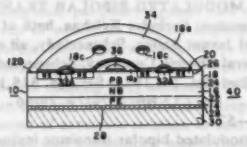
a sixth region of second conductivity P type adjacent said first region and isolated from said second region by said first region, said sixth region having a control gate electrode attached for controlling a thyristor formed by said first, second, third and fourth regions;
whereby said first, second, third, and fourth regions form a thyristor device, and said fourth, third, and fifth regions constitute a vertical third transistor for heavy currents.

3,979,767

MULTILAYER P-N JUNCTION SEMICONDUCTOR SWITCHING DEVICE HAVING A LOW RESISTANCE PATH ACROSS SAID P-N JUNCTION

Josuke Nakata, and Ryuji Denda, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 264,547, June 20, 1972, abandoned. This application Sept. 20, 1973, Ser. No. 399,047
Claims priority, application Japan, June 24, 1971, 46-45958
Int. Cl.² H01L *29/74, 23/48, 29/06, 27/02*
U.S. Cl. 357—38 **7 Claims**



1. A semiconductor switching device comprising:
a first semiconductor layer,
a second semiconductor layer engaging said first semiconductor layer and forming a first P-N junction therebetween,
a third semiconductor layer engaging said second semiconductor layer and forming a second P-N junction therebetween,

a fourth semiconductor layer engaging said third seiconductor layer and forming a third P-N junction therebetween,

an additional semiconductor layer extending across at least a portion of said third P-N junction for providing an electrically resistive path thereacross, said additional layer comprising a metal selected from the group consisting of Al, Ni, Pt, Co, Cu, Mo and Ti,

a first main electrode forming a contact with said first semiconductor layer,

a second main electrode forming a physical and electrical contact with said fourth semiconductor layer without forming a physical contact with said third semiconductor layer.

3,979,768

SEMICONDUCTOR ELEMENT HAVING SURFACE COATING COMPRISING SILICON NITRIDE AND SILICON OXIDE FILMS

Ichiro Takei, Kodaira; Katsuyoshi Sasaki, Fujisawa, and Sumio Nishida, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

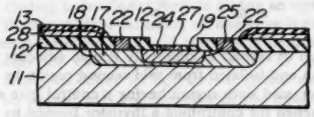
Filed Mar. 17, 1967, Ser. No. 623,903

Claims priority, application Japan, Mar. 23, 1966, 41-17415

The portion of the term of this patent subsequent to Dec. 16, 1986, has been disclaimed.

Int. Cl.² H01L 29/34

U.S. Cl. 357—54 **11 Claims**



1. A semiconductor device comprising a semiconductor substrate of a first conductivity type; a first insulating film consisting essentially of silicon nitride, said first insulating film being formed in contact with the major surface of said semiconductor substrate and having a first hole exposing a part of said major surface of said substrate; a diffused semiconductor region of a second conductivity type opposite to said first conductivity type formed in said major surface and forming a PN junction with said substrate, the end portion of said PN junction wholly extending to the major surface and being covered with said first insulating film; and an insulating oxide film formed in said first hole to cover said diffused semiconductor region and having a second hole exposing a part of said diffused semiconductor region.

3,979,769

GATE MODULATED BIPOLAR TRANSISTOR

Douglas E. Houston; Surinder Krishna, both of Ballston Lake, and Bantval Jayant Baliga, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 16, 1974, Ser. No. 515,164

Int. Cl.² H01L 29/72, 29/66

U.S. Cl. 357—57 **12 Claims**

1. A gate modulated bipolar transistor including:

an emitter region, at least one collector region and at least one gate region integral with a base region;

a first region of a first type conductivity as the base region;

a second region having a second type conductivity as the emitter region;

the first region having two opposed major surfaces;

the second region having two opposed major surfaces;

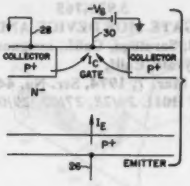
the major opposed surfaces being the top and bottom surfaces of the respective regions;

the top surface of the second region being coextensive and contiguous with the bottom surface of the first region;

a first P-N junction between the top surface of the second region and the bottom surface of the first region;

at least one first ohmic electrical contact centrally, disposed upon the top surface of the first region;

at least two spaced third regions having second type conductivity as collector regions disposed in a portion of the top surface of the first region wherein the first ohmic contact is centrally disposed therebetween and each region having a selected surface opposed to a selective surface of the other thereby defining the gate region of the device;



a second P-N junction between each third and first regions;

a second ohmic electrical contact affixed to the bottom surface of the second region; and

a third ohmic electrical contact affixed to each of the third regions, and wherein

when a variable voltage source, operating between predetermined limits, is connected to the first ohmic contact to drive the gate region and a reverse bias is applied to the collector via the third contacts, an increase in the gate-collector reverse bias decreases the emitter and collector currents and the transistor functions as a negative resistance element, the magnitude of which is modulated by the variable voltage source.

3,979,770

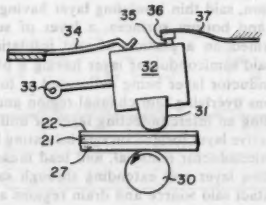
SYSTEM FOR PREVENTING ERASURE OF AUDIO RECORDINGS

Albert F. Wild, Rochester, N.Y., assignor to Tapecon, Inc., Rochester, N.Y.

Filed May 23, 1975, Ser. No. 580,149

Int. Cl.² G11B 15/04, 19/04

U.S. Cl. 360—60 **16 Claims**



1. In a system for recording onto and playing back from a magnetic recording strip extending along a face surface of a card or photograph and including a recorder having a slot and a magnetic head adjacent said slot for tracking said magnetic strip, an improvement preventing recording over any selected portion of said magnetic strip, said improvement comprising:

a. material secured to said card or photograph and extending along said card or photograph for a length equal to the length of said selected portion of said magnetic strip;

b. said material substantially thickening said card or photograph in the region of said material;

c. means in said recorder for detecting the presence of said material on said card or photograph for said length of said material; and

d. means in said recorder responsive to said detecting means for disabling the record mode of said recorder to prevent recording over said selected portion of said magnetic strip.

3,979,771

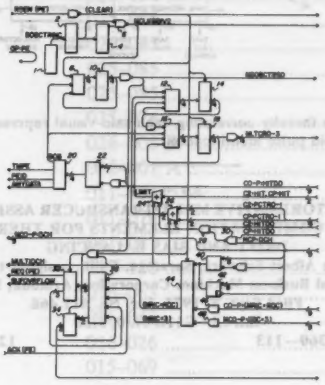
MAGNETIC TAPE PHASE ENCODED DATA READ CIRCUIT

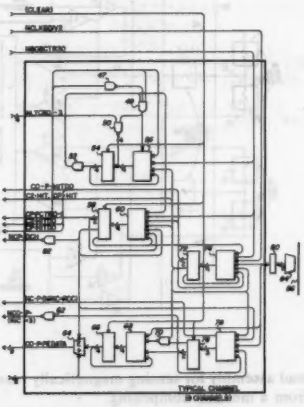
William Devore Taggart, Jr., Torrance, and Franklin Satoshi Itami, Manhattan Beach, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 19, 1975, Ser. No. 559,635

Int. Cl.[2] G11B *5/09*

U.S. Cl. 360—51 8 Claims





1. A digital circuit for reading phase encoded data from a magnetic tape comprising:

a read head for reading data bits and phasing bits which comprise phase encoded data from said magnetic tape,

a phase lock loop circuit for generating from said data bits and electronic window defining that portion of each data bit cycle during which a data will be read by said read head, said phase lock loop circuit comprising:

a. digital counter means for receiving said data bits and for counting a number of time intervals between said data bits, and

b. decoder means for receiving said digital counter means output and producing an electronic window therefrom, and

logic means for producing as an output each bit received by said logic means from said read head during the time defined by said window, and for inhibiting the output of each bit received during the time interval between windows.

3,979,772

AUTOMATIC TAPE LOADING TYPE RECORDING AND/OR REPRODUCING APPARATUS

Hiroyuki Umeda, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

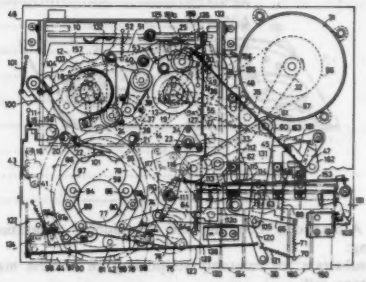
Continuation of Ser. No. 441,306, Feb. 11, 1974, abandoned.

This application Sept. 11, 1975, Ser. No. 612,332

Claims priority, application Japan, Feb. 12, 1973, 48-17171; Feb. 12, 1973, 48-17172; Feb. 12, 1973, 48-17173; Feb. 14, 1973, 48-17498; Feb. 13, 1973, 48-17621; Feb. 15, 1973, 48-18615; Feb. 19, 1973, 48-19945; Feb. 15, 1973, 48-19863[U]

Int. Cl.[2] G11B *23/04, 15/66*

U.S. Cl. 360—85 22 Claims



1. An automatic tape loading type recording and/or reproducing apparatus comprising: a cylindrical tape guide structure means having at least one transducer such as a rotating head; tape drawing and guiding means for drawing a tape-shaped recording medium out of a tape accommodating casing structure and for wrapping said tape in contact with a specific arcuate section of said cylindrical tape guide structure; a single driving power source means such as a motor; a rotating body driven in rotation by said driving power source means; an eccentric rotating structure having a center of eccentric rotation and a circular periphery, the radial distance between the periphery and the center of rotation varying gradually and proportionally between a minimum and a maximum according to the angular positions thereof, said rotating structure pressing said periphery against said rotating body and being driven in eccentric rotation responsive to power transmitted thereto from said rotating body, said eccentric rotating structure displacing the center of eccentric rotation with respect to said rotating body according to the rotational angular position thereof; means for transmitting the displacement of the center of eccentric rotation to said tape drawing and guiding means, said transmitting means operating responsive to the displacement of said center of eccentric rotation in one direction as a result of an initial one half revolution of said eccentric rotating structure for causing said tape drawing and guiding means to draw said recording medium from said tape accommodating casing structure and to cause the same to be brought into contact with said cylindrical tape guide structure, and said transmitting means operating responsive to the displacement of said center of eccentric rotation in an opposite direction responsive to the succeeding one half revolution of said eccentric rotating structure for causing said tape drawing and guiding means to separate said recording medium from

the tape guide structure and to return the same to be accommodated within said casing structure; and operating means for moving said center of eccentric rotation back and forth in opposite directions at the end position in one direction, said operating means holding said eccentric rotating structure in a position where it no longer presses against said rotating body thereby ending the transmission of rotational power from said rotating body to said eccentric rotating structure.

3,979,773

MAGNETIC RECORDING AND REPRODUCING APPARATUS

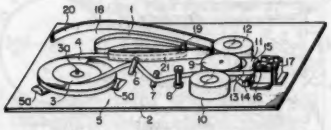
Norikazu Sawazaki, Yokohama; Hiroyuki Tsukamoto, Kawasaki, and Motoi Yagi, Zushi, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 22, 1974, Ser. No. 462,712

Claims priority, application Japan, Apr. 28, 1973, 48-47352; Apr. 28, 1973, 48-47354

Int. Cl.[2] G11B *5/55, 15/60, 23/06*

U.S. Cl. 360—106 **10 Claims**



1. A magnetic recording and reproducing apparatus comprising:

a substrate for rotatably supporting an endless magnetic tape roll,

the tape having a length of less than 300 meters,

driving means comprising a driving capstan and at least one pinch roll in contact with the capstan through the magnetic tape to run the tape,

a plurality of rubber rolls rotatably mounted on the substrate and arranged in the radial direction of the tape roll to support the underside thereof to apply to the tape roll a force against a centrifugal force generated on the tape roll rotated by the driving means.

a magnetic head,

an electric circuit for supplying frequency modulated video signals to the magnetic head and for receiving frequency modulated video signals from the magnetic head.

3,979,774

DIGITAL CONTROL SYSTEM AND METHOD FOR THE SYNCHRONIZATION OF AUDIO-VISUAL EQUIPMENT

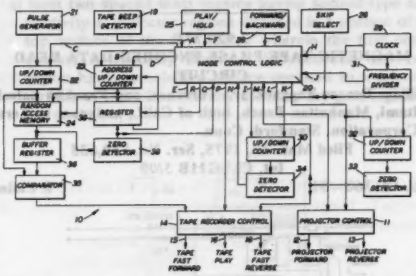
Chun-Fu Chen, North Canton, and Duane O. Hague, Jr., Fairborn, both of Ohio, assignors to The University of Akron, Akron, Ohio

Filed Mar. 13, 1974, Ser. No. 450,897

Int. Cl.[2] G03B *31/00*; G11B *31/00*

U.S. Cl. 360—80 **10 Claims**

9. A method for the synchronization of audio-visual equipment for presenting a plurality of visual representations coordinated with a like plurality of sound narrations carried by a continous media comprising the steps of: generating a series of pulses as the continuous media carrying said sound narration passes through the audio-visual equipment, counting each consecutive visual representation passing through the audio-visual equipment, providing a pulse identification for each consecutive sound narration, and storing, in a means having consecutive locations for each said consecutive visual representation, the pulse identification for each consecutive sound



narration thereby correlating each said visual representation with a said pulse identification.

3,979,775

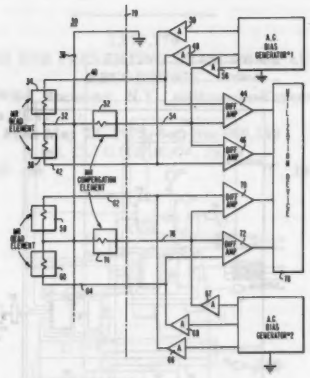
MAGNETORESISTIVE MULTITRANSDUCER ASSEMBLY WITH COMPENSATION ELEMENTS FOR THERMAL DRIFT AND BIAS BALANCING

Theodore Albert Schwarz, Saratoga, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 8, 1975, Ser. No. 611,466

Int. Cl.[2] G11B *5/30, 5/20*

U.S. Cl. 360—113 **12 Claims**



1. A head assembly for sensing magnetically recorded information from a medium comprising:

a plurality of magnetoresistive elements sensing the magnetically recorded information and providing information signals from each indicative of a resistance of each element

a compensating element, providing a reference signal indicative of its resistance

a return bias and signal path conductor means providing one input to each element; and

conductor means for supplying a bias current to each element and for providing said information signals and said reference signal, whereby difference signals can be derived by differentially sensing said information signals with said reference signal.

DESIGN PATENTS

GRANTED SEPTEMBER 7, 1976

ERRATA

For CLASS	See PATENT NO.
025–056	241,333
025–056	241,334
025–085	241,335
025–085	241,336
025–085	241,337
025–085	241,338
025–074	241,339
026–005 R	241,340
026–001 A	241,341
011–004	241,364
011–079	241,365
011–081	241,366
015–128	241,369
016–083	241,371
016–042	241,372
016–026	241,373
015–069	241,376

DESIGN PATENTS

GRANTED SEPTEMBER 7, 1976

ERRATA

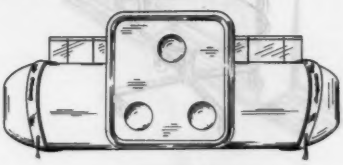
DESIGNS

SEPTEMBER 7, 1976

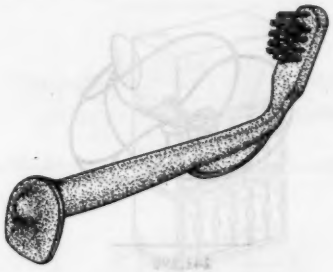
241,283
BOOT
James F. Summa, Naugatuck, and John R. White, Woodbridge, Conn., assignors to Uniroyal, Inc.
Filed Apr. 17, 1975, Ser. No. 569,126
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—272

241,284
TIE
John P. Johnston, Tamuning, Territory of Guam (Coty Towers Suite 301, 731 Amaaa St., Honolulu, Hawaii 96814)
Filed Aug. 21, 1974, Ser. No. 499,318
Term of patent 14 years
Int. Cl. D2—*05*
U.S. Cl. D2—352

241,285
FISHERMAN'S BELT
Leonard Troutman, 511 S. 55 West Ave., Tulsa, Okla. 74107
Filed May 9, 1975, Ser. No. 576,006
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—381



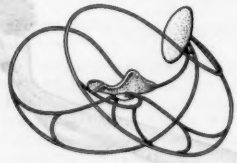
241,286
TOOTHBRUSH
Calvin B. Hadley, 204 Lynn, Waynesville, Mo. 65583
Filed June 19, 1975, Ser. No. 588,411
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—25



241,287
CLOSABLE DRESSING TABLE FOR AN INFANT
Daniel Murray Earle, Charlotte, and Leonard James Howell, Locust, N.C., assignors to Eskay Products, Inc.
Filed Apr. 28, 1975, Ser. No. 572,501
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—5

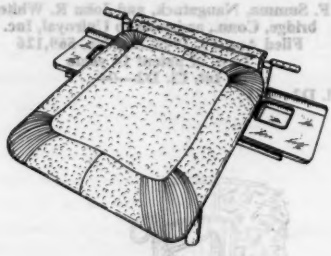
241,288
CHAIR
William H. Tacke, Wyoming, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.
Filed Jan. 2, 1974, Ser. No. 429,063
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

241,289
ROCKING CHAIR
William Ayton Lishman, R.R. 1, Blackstock, Ontario, Canada
Filed Apr. 7, 1975, Ser. No. 565,833
Claims priority, application Canada Nov. 5, 1974
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—49



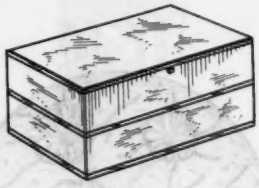
241,290
CHAIR
Ted A. Walker, Fresno, Calif. (1320 N. Hunter, No. 8. Stockton, Calif. 95202)
Filed Mar. 31, 1975, Ser. No. 563,855
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—73

241,291
BED
Giovanni Offredi, Milan, Italy, assignor to Fratelli Saporiti, Besnate, Varese, Italy
Filed Mar. 18, 1974, Ser. No. 452,415
Claims priority, application Italy Sept. 21, 1973
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—80

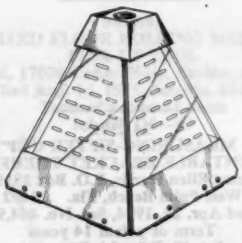


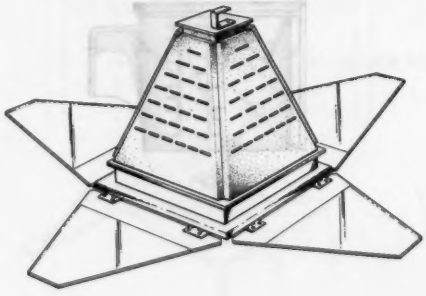
241,292
ADVERTISING DISPLAY EASEL
Donald P. Weiss, Kinnelon, N.J., assignor to Advertising Displays Corporation, Englewood Cliffs, N.J.
Filed Sept. 10, 1975, Ser. No. 611,870
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—85

241,293
CABINET
Victorio Introini, Gallarate, Italy, assignor to Fratelli Saporiti, Besnate, Varese, Italy
Filed Mar. 18, 1974, Ser. No. 452,413
Claims priority, application Italy Sept. 21, 1973
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—165

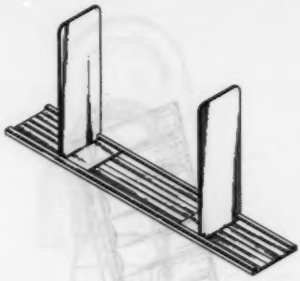


241,294
JEWELRY DISPLAY CASE
Earl Zimbler, New York, N.Y., assignor to Jewelcor Incorporated, New York, N.Y.
Filed Sept. 4, 1975, Ser. No. 610,497
Term of patent 14 years
Int. Cl. D6—*04;* D20—*02*
U.S. Cl. D6—173

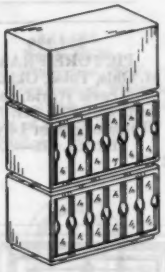




241,295
ADJUSTABLE BOOK RACK
Leonard Entin, Wayland, Mass., assignor to Opus, Incorporated, Boston, Mass.
Filed Oct. 9, 1974, Ser. No. 513,456
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—184

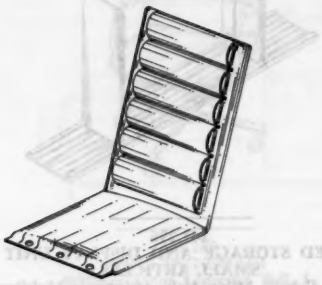


241,296
COMBINED STORAGE AND DISPLAY UNIT FOR SMALL ARTICLES
Mario Cobelli, Milan, Italy, assignor to Multibrev Anstalt, Vaduz, Liechtenstein
Filed Aug. 14, 1975, Ser. No. 604,661
Claims priority, application Switzerland Feb. 19, 1975
Term of patent 7 years
Int. Cl. D6—*04;* D20—*02*
U.S. Cl. D6—188

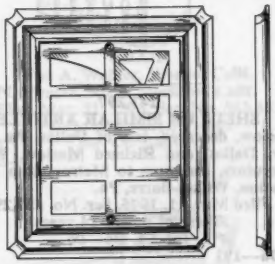


241,297
SHELF OR SIMILAR ARTICLE
Louis Maslow, deceased, late of Dallas, Pa., by Frances Maslow, Dallas, and Richard Maslow, Wilkes-Barre, Pa., executors, assignors to Metropolitan Wire Goods Corporation, Wilkes-Barre, Pa.
Filed Mar. 11, 1975, Ser. No. 557,292
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

241,298
BACK SUPPORT CUSHION
Billy E. Kirby, 938 Vinecrest Lane, Richardson, Tex. 75080
Filed Oct. 29, 1974, Ser. No. 518,550
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—201

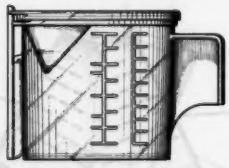


241,299
PICTURE FRAME
Louis M. Ohls, Tulsa, Okla., assignor to Travis World, Inc.
Filed Sept. 26, 1974, Ser. No. 509,798
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—235

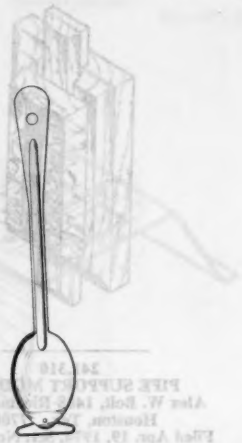


241,300
PLATE OR SIMILAR ARTICLE
Frank J. Benes, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Original design application July 18, 1973, Ser. No. 380,272, now Patent No. 237,031. Divided and this application Dec. 6, 1974, Ser. No. 530,126
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—28

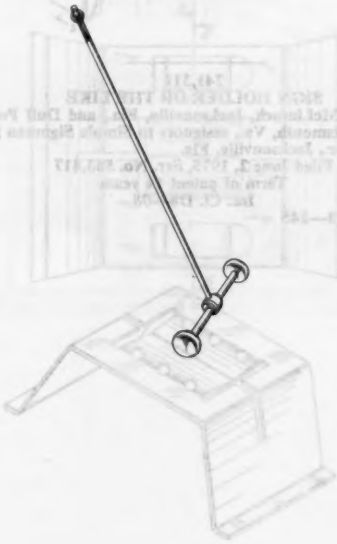
241,301
COMBINED MEASURING-SIFTER CUP AND WALL MOUNTABLE BRACKET THEREFOR
Janet Ellen Harris, P.O. Box 2819, West Palm Beach, Fla. 33402
Filed Apr. 29, 1974, Ser. No. 464,962
Term of patent 14 years
Int. Cl. D7—*04;* D10—*04*
U.S. Cl. D7—50



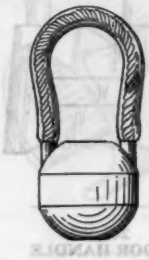
241,302
COMBINED STIRRING AND SCRAPING SPOON
Robert E. Scigliano, 176 Vinal St., Revere, Mass. 02151
Filed Dec. 17, 1974, Ser. No. 533,635
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—148



241,303
MAGNETIZED FLOOR ROLLING METAL OBJECT PICK-UP TOOL
Dan Sandel, 17000 Cotter Place, Encino, Calif. 91316
Filed Aug. 14, 1975, Ser. No. 604,660
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—14



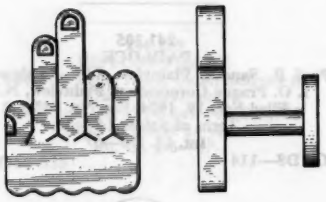
241,304
SHACKLE LOCK
Paul F. Sander, Plainview, N.Y., assignor to I. O. Prague Corporation, Plainview, N.Y.
Filed Feb. 19, 1974, Ser. No. 443,371
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—114



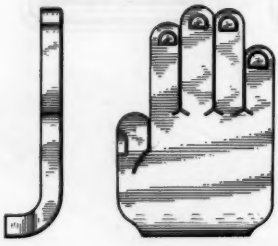
241,305
PADLOCK
Paul F. Sander, Plainview, N.Y., assignor to I. O. Prague Corporation, Plainview, N.Y.
Filed Feb. 19, 1974, Ser. No. 443,372
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—114

241,306
TAPERED BODY PADLOCK
Daniel J. Foote, Wauwatosa, Wis., assignor to Master Lock Company, Milwaukee, Wis.
Filed Dec. 8, 1975, Ser. No. 638,808
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—114

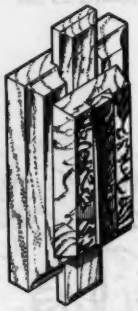
241,307
DOOR HANDLE
Christopher J. Hoskins, 7205 S. Exchange, Chicago, Ill. 60649
Filed June 20, 1975, Ser. No. 588,594
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—146



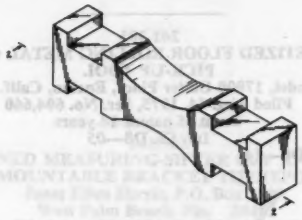
241,308
PULL PLATE FOR A DOOR
Christopher J. Hoskins, 7205 S. Exchange, Chicago, Ill. 60649
Filed June 20, 1975, Ser. No. 588,777
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—146



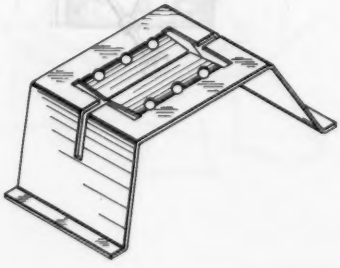
241,309
LIGHT SWITCH COVER
Ellen G. Barr, 469 Cypress Ave., Apt. 3, Half Moon Bay, Calif. 94019
Filed June 6, 1975, Ser. No. 584,636
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—179



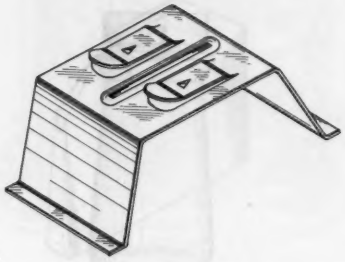
241,310
PIPE SUPPORT MODULE
Alex W. Bolt, 1408 Richmond 255, Houston, Tex. 77006
Filed Apr. 19, 1974, Ser. No. 462,399
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—235



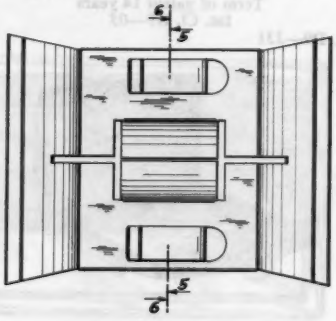
241,311
SIGN HOLDER OR THE LIKE
David L. McLintock, Jacksonville, Fla., and Duff Porter III, Portsmouth, Va., assignors to Simple Signman Systems, Inc., Jacksonville, Fla.
Filed June 2, 1975, Ser. No. 583,417
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—245



241,312
SIGN HOLDER OR THE LIKE
David L. McLintock, Jacksonville, Fla., and Duff Porter III, Portsmouth, Va., assignors to Simple Signman Systems, Inc., Jacksonville, Fla.
Filed June 2, 1975, Ser. No. 583,416
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—245



241,313
SIGN HOLDER OR THE LIKE
David L. McLintock, Jacksonville, Fla., assignor to Simple Signman Systems, Inc., Jacksonville, Fla.
Filed Dec. 15, 1975, Ser. No. 640,951
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—245



241,314
RESTRAINER TO MAINTAIN THE INOPERATIVE CONDITION OF A PULL-TYPE CIRCUIT BREAKER
Norman L. Hug, Cypress, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.
Filed Sept. 11, 1975, Ser. No. 612,377
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—246

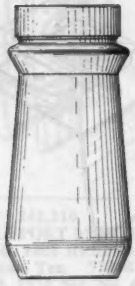
241,315
KICK PLATE FOR A DOOR
Christopher J. Hoskins, 7205 S. Exchange, Chicago, Ill. 60649
Filed June 20, 1975, Ser. No. 588,658
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—263

241,316
PUSH PLATE FOR A DOOR
Christopher J. Hoskins, 7205 S. Exchange
Chicago, Ill. 60649
Filed June 20, 1975, Ser. No. 588,659
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—263

241,317
BOTTLE OR SIMILAR ARTICLE
Rogers F. Brackman, Wheaton, Ill., assignor to Borden, Inc., Columbus, Ohio
Filed May 7, 1973, Ser. No. 358,114
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—64

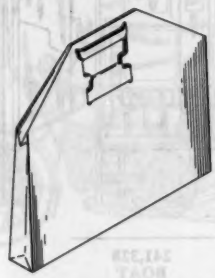
241,318
BOTTLE OR SIMILAR ARTICLE
John Wayne Lewman, Blue Springs, Mo., assignor to Ethyl Development Corporation, Kansas City, Mo.
Filed Apr. 24, 1975, Ser. No. 571,319
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—113

241,319
COMBINED JAR AND CAP
Bruce Hefkey, Bolton, Ontario, Alan Preston Darling, Toronto, Ontario, and Edward R. B. Dyke, Shelburne, Ontario, Canada, assignors to General Foods, Limited
Filed Sept. 16, 1974, Ser. No. 506,390
Claims priority, application Canada Mar. 14, 1974
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—131

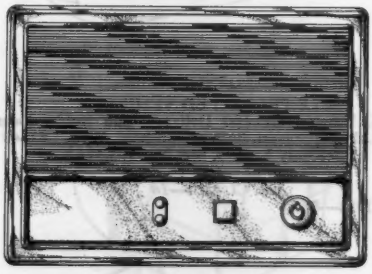


241,320
HINGED BOX
Donald K. Takacs, Wheaton, Ill., assignor to Richardson-Merrell Inc., Wilton, Conn.
Filed Jan. 7, 1975, Ser. No. 539,113
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—231

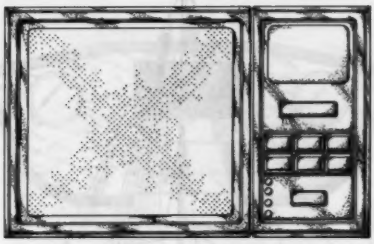
241,321
CARRIER BAG
Richard E. Paige, New York, N.Y., assignor to APL Corporation, Great Neck, N.Y.
Filed Jan. 30, 1975, Ser. No. 545,445
Term of patent 14 years
Int. Cl. D9—*05*
U.S. Cl. D9—249



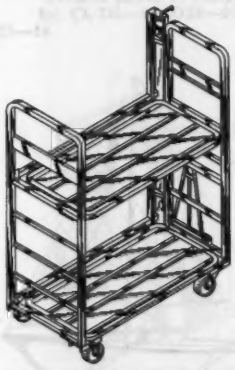
241,322
SECURITY CONSOLE
Walton E. Sparks, Lexington, and Richard K. Weiss, Mansfield, Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Apr. 29, 1975, Ser. No. 572,811
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



241,323
SECURITY CONSOLE
Walton E. Sparks, Lexington, and Richard K. Weiss, Mansfield, Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Apr. 29, 1975, Ser. No. 572,812
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106

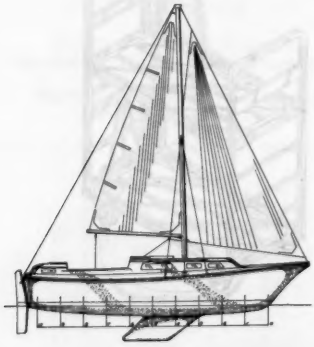


241,324
NESTING CART
Leonard E. Wright, Paradise Valley, Ariz., assignor to Tradewinds Industries, Inc., Liberal, Kans.
Filed Jan. 31, 1975, Ser. No. 545,813
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—29

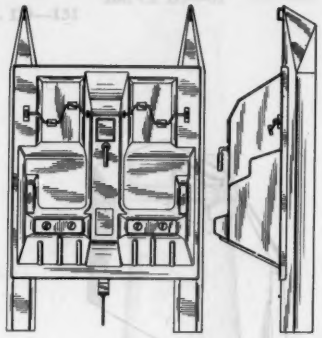


241,325
SAILBOAT
William I. B. Crealock, 1401 Forest Ave., Carlsbad, Calif. 92008
Filed June 23, 1975, Ser. No. 589,617
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—64

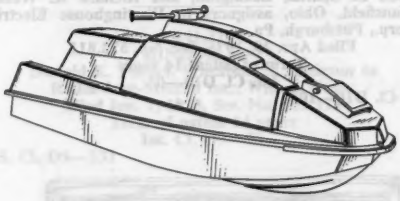
241,326
SAILBOAT
William I. B. Crealock, 1401 Forest Ave., Carlsbad, Calif. 92008
Filed June 23, 1975, Ser. No. 589,691
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—64



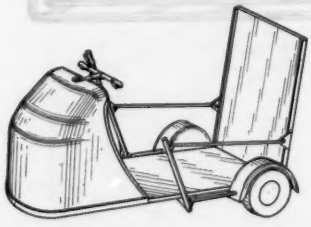
241,327
WATER BIKE
Richard B. Compton, 2901 119th Ave. NW., Coon Rapids, Minn. 55433
Filed July 17, 1975, Ser. No. 596,958
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—68



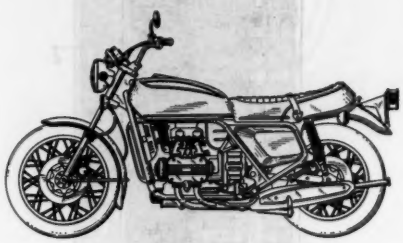
241,328
BOAT
Hiroshi Naito and Masaharu Nobori, Akashi, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Hyogo-ken, Japan
Filed Dec. 9, 1975, Ser. No. 639,041
Claims priority, application Japan June 16, 1975
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—69



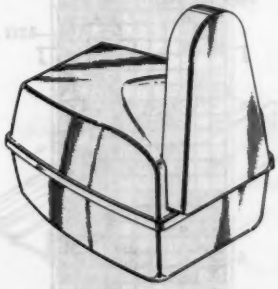
241,329
SELF-PROPELLED VEHICLE
Larry G. Forster, General Delivery, and Bobby Dean Clark, Lakeside Resort, both of Shoshoni, Wyo. 82649
Filed July 7, 1975, Ser. No. 593,324
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—85



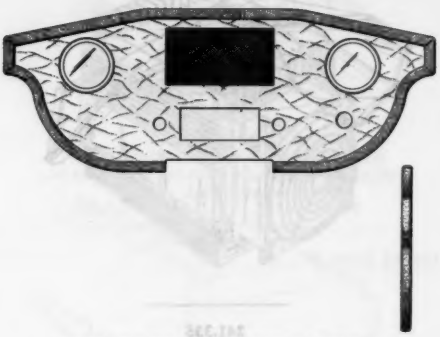
241,330
MOTORCYCLE
Minoru Morioka, Niiza, Tetsuo Ogishima, Shiki, and Koji Nakano, Oimachi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 23, 1974, Ser. No. 517,428
Claims priority, application Japan Apr. 30, 1974
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—110



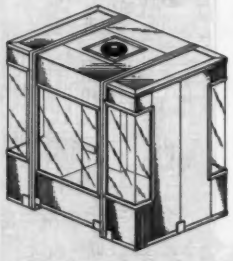
241,331
COMBINED MOTORCYCLE CARRIER TRUNK AND BACK REST
Roy D. Mattson and Ross B. Mattson, Lake Elmo, Minn., assignors to Accessory Research Engineering, St. Paul, Minn.
Filed Mar. 24, 1975, Ser. No. 561,334
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—158



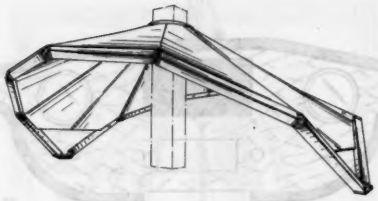
241,332
MOTORCYCLE DASH PANEL
Roy R. Gordon, 508 Lakelawn, Aurora, Ill. 60506
Filed July 29, 1974, Ser. No. 492,699
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—192



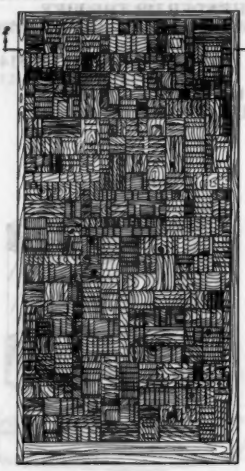
241,333
NOISE REDUCING ENCLOSURE FOR A COLD HEADER OR THE LIKE
Richard T. Wheeler, 20 Hemlock Drive, Vernon, Conn. 06066
Filed Feb. 28, 1974, Ser. No. 446,814
Term of patent 14 years
Int. Cl. D6—*99*; D25—*99*
U.S. Cl. D25—16



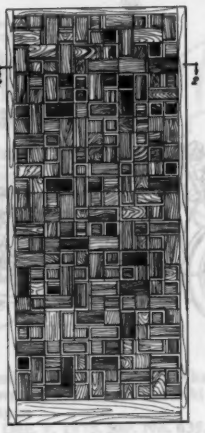
241,334
ROOF STRUCTURE
Peter Howard, New York, N.Y., assignor to Imero Fiorentino Associates, Inc., New York, N.Y.
Filed Nov. 22, 1974, Ser. No. 526,386
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—56



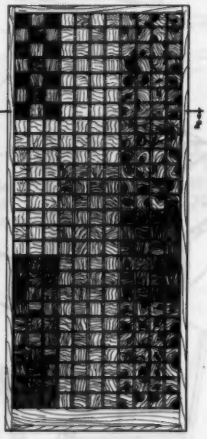
241,335
DECORATIVE PANEL OR THE LIKE
Barbara J. Bogan, P.O. Box 26208, Albuquerque, N. Mex. 87125
Filed Feb. 1, 1974, Ser. No. 438,548
Term of patent 14 years
Int. Cl. D25—*01, 02*
U.S. Cl. D25—85



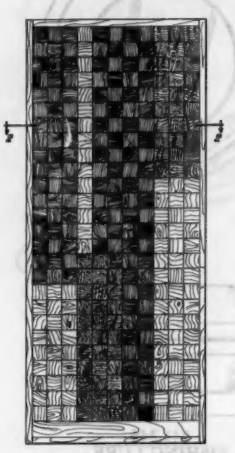
241,336
DECORATIVE PANEL OR THE LIKE
Barbara J. Bogan, P.O. Box 26208, Albuquerque, N. Mex. 87125
Filed Feb. 4, 1974, Ser. No. 439,358
Term of patent 14 years
Int. Cl. D25—*01, 02*
U.S. Cl. D25—85



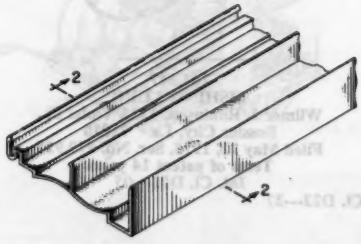
241,337
DECORATIVE PANEL OR THE LIKE
Robert T. Bogan, P.O. Box 26208, Albuquerque, N. Mex. 87125
Filed Feb. 4, 1974, Ser. No. 439,359
Term of patent 14 years
Int. Cl. D25—*01, 02*
U.S. Cl. D25—85



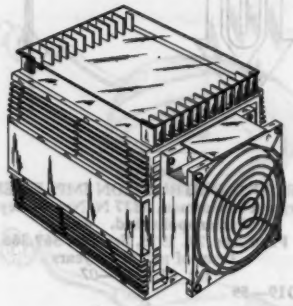
241,338
DECORATIVE PANEL OR THE LIKE
Robert T. Bogan, P.O. Box 26208, Albuquerque, N. Mex. 87125
Filed Feb. 6, 1974, Ser. No. 439,885
Term of patent 14 years
Int. Cl. D25—*01, 02*
U.S. Cl. D25—85



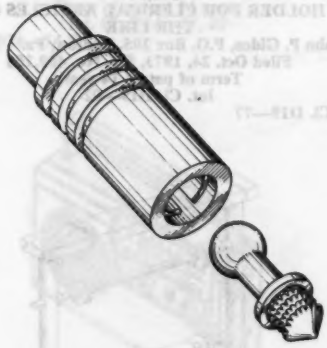
241,339
WINDOW TRIM
Joseph N. La Borde, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.
Continuation of design applications Ser. No. 382,727, July 26, 1973, and Ser. No. 433,303, Jan. 14, 1974, both now abandoned. This application June 19, 1975, Ser. No. 588,327
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



241,340
SOLID STATE DC SERVO CONTROLLER
Donald H. Jones, Kenneth R. Wyman, and Joseph A. Russo, Pittsburgh, Pa., assignors to Control Systems Research, Inc., Pittsburgh, Pa.
Filed Nov. 7, 1973, Ser. No. 413,597
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—5 R

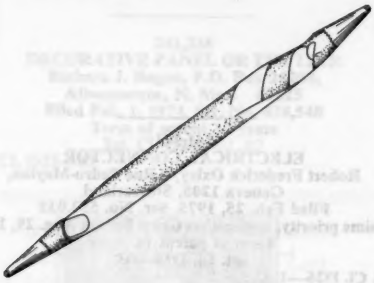


241,341
ELECTRICAL CONNECTOR
Robert Frederick Oxley, 8 Rue Pedro-Meylan, Geneva 1208, Switzerland
Filed Feb. 25, 1975, Ser. No. 553,033
Claims priority, application Great Britain Aug. 29, 1974
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A

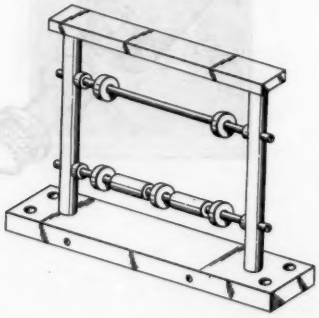


241,342
BOOKMARK
William A. Carroll, Warwick, R.I., assignor to Lillian Vernon Corporation
Filed Apr. 28, 1975, Ser. No. 572,618
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D19—34

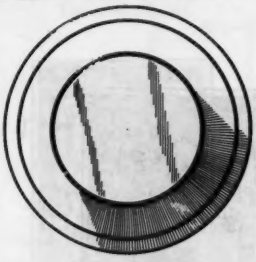
241,343
WRITING INSTRUCTION IMPLEMENT
Margaret L. Harmon, 3837 N. New Jersey St., Indianapolis, Ind. 46205
Filed Apr. 21, 1975, Ser. No. 569,866
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—59

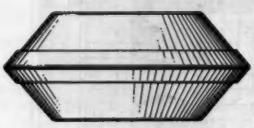


241,344
HOLDER FOR CLERICAL ARTICLES OR THE LIKE
John P. Gidos, P.O. Box 205, Ludlow, Pa. 16333
Filed Oct. 24, 1973, Ser. No. 409,156
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—77

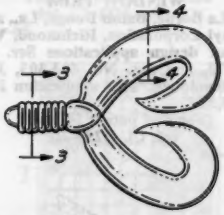


241,345
PAPERWEIGHT
Lilly D. Struchen and Harry B. Young, both of 1218 Cota Ave., Torrance, Calif. 90501
Filed Jan. 10, 1975, Ser. No. 540,303
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—96

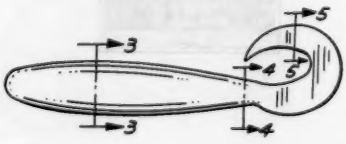




241,346
FISHING LURE
Robert G. Carver, Athens, La. (P.O. Box 741, Minden, La. 71055)
Filed Apr. 7, 1975, Ser. No. 565,586
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

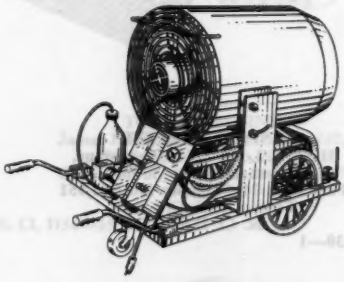


241,347
FISHING LURE
Wilmer J. Robinson, 1313 Violet St., Bossier City, La. 71010
Filed May 22, 1975, Ser. No. 579,927
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



241,348
FISHING LURE
Ray A. Jones, 745 Broadview St., Spring Valley, Calif. 92077, and Emory D. Richards, 567 Cardiff, San Diego, Calif. 92114
Filed Oct. 9, 1975, Ser. No. 621,223
Term of patent 7 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

241,349
CHEMICAL SPRAYER
James G. Parke, San Antonio, Tex., assignor to Micro-Gen Equipment Corp., San Antonio, Tex.
Filed Mar. 31, 1975, Ser. No. 563,669
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18



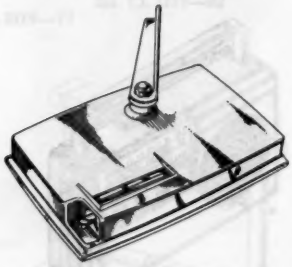
241,350
TELEPHONE RECEIVER OR SIMILAR ARTICLE
Tonis Kao, Munich, and Herbert Kramer, Furstenfeldbruck, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany
No Drawing. Filed July 29, 1974, Ser. No. 492,925
Claims priority, application Germany Jan. 29, 1974
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A

241,351
COMBINED TAPE RECORDER AND RADIO RECEIVER
Takemi Ebata, Kyoto, and Shinzi Makino, Hirakata, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed Apr. 15, 1975, Ser. No. 568,373
Claims priority, application Japan Oct. 18, 1974
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D26—14 B

241,352
ELECTRICAL PLUG
Higenia Acosta, 332 E. 14th St., New York, N.Y. 10003
Filed Oct. 16, 1975, Ser. No. 623,062
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 B

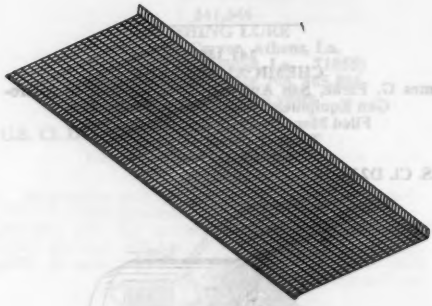
241,353
CIGARETTE LIGHTER
Pierre Marie Francois Martin, 74 Rue St. Lazare, Paris, France
Filed July 10, 1974, Ser. No. 487,180
Claims priority, application France Jan. 10, 1974
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

241,354
CIGARETTE MAKING MACHINE
Arnold Kastner, 10220 Armand La Vergne, Montreal, Quebec, Canada
Filed Nov. 7, 1974, Ser. No. 521,631
Term of patent 14 years
Int. Cl. D27—*99*
U.S. Cl. D27—51

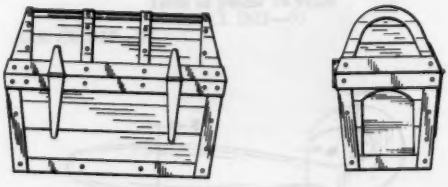


241,355
PIPE
Louis J. Fenster, Panorama City, Calif., assignor to Cerami-Tex Co.
Filed Apr. 14, 1975, Ser. No. 567,984
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—3

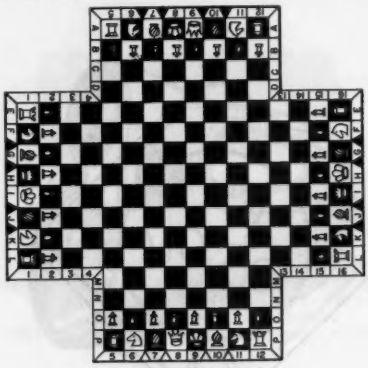
241,356
LAY CYCLE POULTRY CAGE BOTTOM
Gerald L. Kitson, 9709 Belding Road, Rockford, Mich. 49341
Filed Oct. 23, 1973, Ser. No. 409,019
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—2



241,357
ANIMAL SHELTER
Harry L. Long, 1211 Cherrystone, Norman, Okla. 73069
Filed Mar. 24, 1975, Ser. No. 561,051
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1



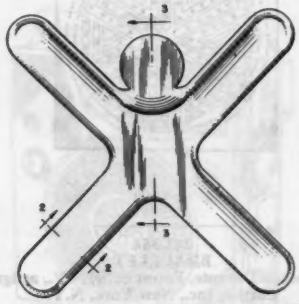
241,358
CHESS GAME BOARD
John A. Benson, Jr., Alta Loma, Calif. 91701
Filed Apr. 30, 1974, Ser. No. 465,567
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



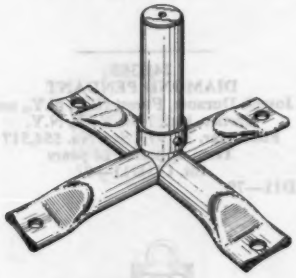
241,359
GOLF CLUB HEAD
David L. Taylor, 380 W. Carmel Valley Road, Carmel Valley, Calif. 93924
Filed Dec. 4, 1974, Ser. No. 529,470
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

241,360
TOY JET ENGINE
James J. Scozzafava, P.O. Box 40152, Washington, D.C. 20015
Filed Dec. 23, 1974, Ser. No. 536,937
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 HR

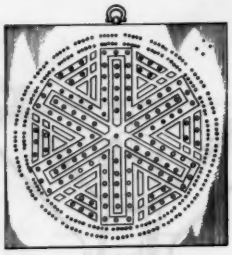
241,361
BOOMERANG
Richard P. Crew, 1635A Walea St., Wahiawa, Oahu, Hawaii 96786
Filed Jan. 9, 1975, Ser. No. 539,777
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 PP



241,362
PLAYGROUND EQUIPMENT BASE
Ronald L. Ewers, 796 Anderson Road, Litchfield, Mich. 49252, and William F. McCombs, 4145 Parklawn Ave., Edina, Minn. 55435
Filed Mar. 3, 1975, Ser. No. 554,412
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 L



241,363
MULTIPURPOSE GAME BOARD
Jean W. Chamberlin, 1340 Placer Ave., Ontario, Calif. 91764
Filed May 1, 1975, Ser. No. 573,539
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



241,364
BRACELET
Alfred Joseph Durante, Forest Hills, N.Y., assignor to Cartier, Inc., New York, N.Y.
Filed Apr. 24, 1974, Ser. No. 463,596
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—4

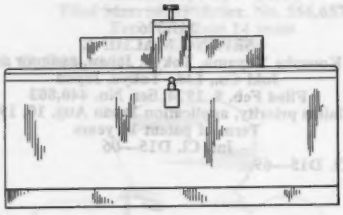
241,365
DIAMOND PENDANT
Alfred Joseph Durante, Forest Hills, N.Y., assignor to Cartier, Inc., New York, N.Y.
Filed Mar. 3, 1975, Ser. No. 554,517
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—79

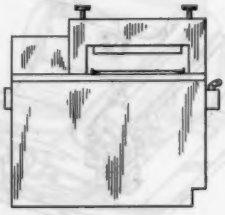
241,366
CHAIN SUSPENDABLE MEDALLION
Guy Augis, Lyon, France, assignor to A. Augis Medailles, Lyon, France
Filed Apr. 3, 1975, Ser. No. 564,905
Claims priority, application France Oct. 8, 1974
Term of patent 3½ years
Int. Cl. D11—*01*
U.S. Cl. D11—81

241,367
TABLE LAMP BASE
David T. Emmel, 2301 SE. 8th Court, Pompano Beach, Fla. 33062
Filed Dec. 30, 1974, Ser. No. 537,783
Term of patent 7 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 R

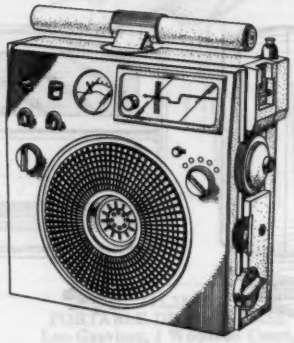
241,368
COMBINED PORTABLE ELECTRIC LANTERN AND RADIO RECEIVER
Kimio Takano and Yasuo Nagamatsu, Fukuoka, Japan, assignors to Matsushita Electrical Industrial Co., Ltd., Kadoma-shi, Osaka, Japan
Filed Apr. 8, 1975, Ser. No. 566,586
Term of patent 14 years
Int. Cl. D14—*03*; D26—*02*
U.S. Cl. D48—24 A

241,369
DIE CUTTING APPARATUS
Henry H. Jenkins, 864 W. Hacienda Drive, Corona, Calif. 92625
Filed July 10, 1975, Ser. No. 594,657
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—128



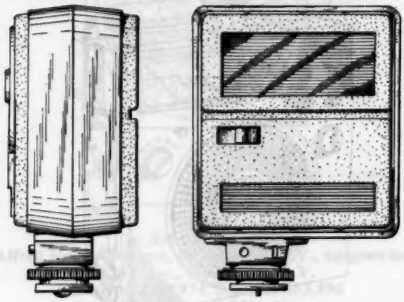


241,370
RADIO RECEIVER
Toshimasa Akazawa and Kazumasa Takenaka, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan
Filed Nov. 7, 1974, Ser. No. 521,807
Claims priority, application Japan June 25, 1974
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

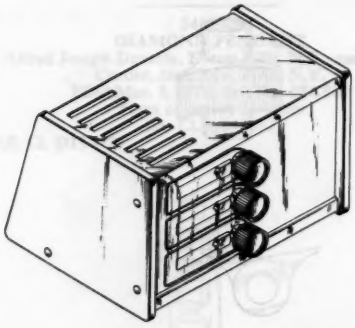


241,371
BINOCULAR ADJUSTMENT KNOB
Claus O. Huckenbeck, Sherman Oaks, Calif., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Apr. 30, 1975, Ser. No. 573,582
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—83

241,372
PHOTO-FLASH UNIT
Masakazu Tomatsuri, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan
Filed May 13, 1974, Ser. No. 469,469
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D16—42



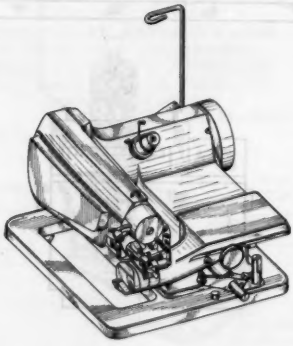
241,373
LIGHT SOURCE FOR PHOTOGRAPHIC ENLARGERS
Robert A. Flieder, Englewood Cliffs, and John M. Kupiec, Demarest, N.J., assignors to Berkey Photo, Inc., Woodside, N.Y.
Filed Jan. 10, 1975, Ser. No. 540,230
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—26



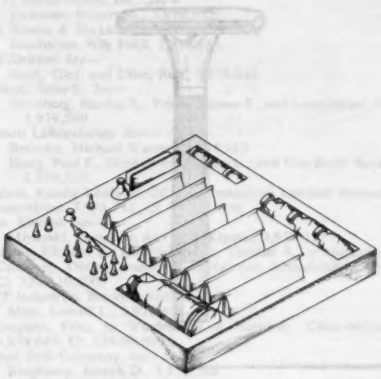
241,374
PAINT ROLLER
Kiyoshi Hori, Suita-shi, Osaka, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan
Filed Mar. 31, 1975, Ser. No. 563,834
Claims priority, application Japan Sept. 30, 1974
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D64—18

241,375
PAINT ROLLER
Kiyoshi Hori, Suita, Osaka, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan
Filed Mar. 31, 1975, Ser. No. 563,836
Claims priority, application Japan Sept. 30, 1974
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D64—18

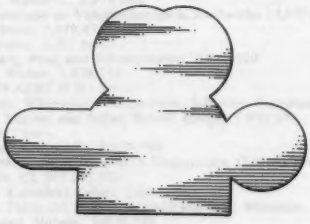
241,376
SEWING MACHINE
Kousuke Yuyama, Tokyo, Japan, assignor to Juki Co., Ltd., Tokyo, Japan
Filed Feb. 8, 1974, Ser. No. 440,802
Claims priority, application Japan Aug. 10, 1973
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—69



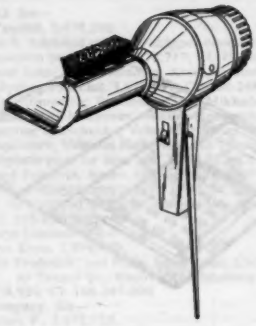
241,377
KIT OF PHARMACEUTICAL PRODUCTS
Jerry D. Whitacre, Los Alamitos, Calif., assignor to HMO International, Los Angeles, Calif.
Filed Jan. 21, 1974, Ser. No. 435,371
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 U



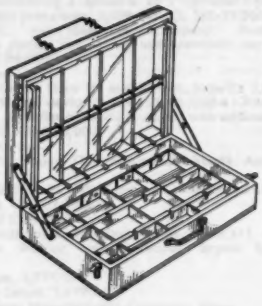
241,378
X-RAY GONADAL SHIELD PLATE
William Burger, 48 Roland Road, Jamestown, N.Y. 14701
Filed Mar. 10, 1975, Ser. No. 556,657
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D83—1 H

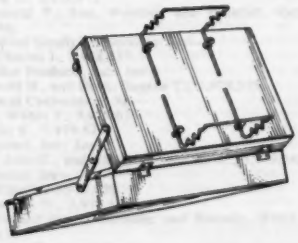


241,379
HAIR GROOMER
Siegfried Müller, Max Reger-Weg 3, 7737 Bad Durrheim, Germany
Filed Mar. 20, 1975, Ser. No. 560,493
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F

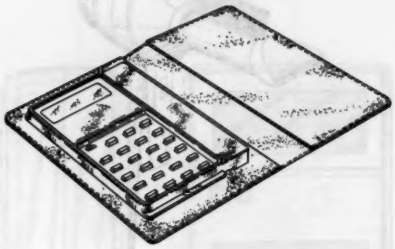


241,380
PORTABLE DISPLAY CASE
Leo Graviner, 1 Woodhue Court, Baltimore, Md. 21207
Filed July 2, 1974, Ser. No. 485,241
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R





241,381
COMBINED CHECKBOOK WALLET AND ELECTRONIC CALCULATOR
Gary E. Garnier, San Jose, Calif., assignor to National Semiconductor Corporation
Filed Feb. 21, 1975, Ser. No. 551,916
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 A



241,382
SAFETY RAZOR
Graham R. Jones, Widdrington, Morpeth, Northumberland, England, assignor to Wilkinson Sword Limited
Filed Nov. 8, 1974, Ser. No. 522,107
Claims priority, application Great Britain May 11, 1974
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3 A

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TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF SEPTEMBER, 1976

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Ando, Kenji: *See—*
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Baker, Albert Leroy, to Wilson Pharmaceutical & Chemical Corporation. Diagnostic system for organ abnormalities. 3,979,507, Cl. 424-1.500.

Bako, Lazlo, to Presto Lock Company, Division of Walter Kidde & Company, Inc. Latching device. 3,978,697, Cl. 70-68.000.

Bakoledis, Andrew G., to USM Corporation. Contractible guide for studs. 3,978,759, Cl. 85-10.00E.

Baliga, Bantval Jayant: *See—*
Houston, Douglas E.; Krishna, Surinder; and Baliga, Bantval Jayant, 3,979,769.

Balliet, Layton, to International Business Machines Corporation. Acquisition process in a phase-locked-loop by switched phase means. 3,979,691, Cl. 331-1.00A.

Ballweber, Edward G.; and Phillips, Kenneth G., to Nalco Chemical Company. Ionic polymers from acrylamide latex polymers. 3,979,348, Cl. 260-29.4UA.

Balne, John Alfred. Ladder caddy. 3,979,097, Cl. 248-211.000.

Balsillie, Tony H.: *See—*
Chambers, Henry B.; Tellefson, Clair W.; and Balsillie, Tony H., 3,978,676.

Bamburg, Robert A.; Duncan, Farris N.; and Floyd, Roger M., to Olinkraft, Inc. Bulk material container. 3,979,045, Cl. 229-23.00R.

Bandyopadhyay, Pratip; and Rhoades, Vaughan W., to Cities Service Company. In situ combustion process for multi-stratum reservoirs. 3,978,920, Cl. 166-258.000.

Bangerskis, Karlis I.: *See—*
Harvey, Walter W.; Randlett, Myron R.; and Bangerskis, Karlis I., 3,979,275.

Bardin, Robert; and Toulouze, Andre, to Rhone-Poulenc S.A. Membrane support-plates for fluid separating apparatus and apparatus using such support-plates. 3,979,297, Cl. 210-232.000.

Bardsley, Charles E., to Agritec, Co. Polyurethane plant growth medium. 3,979,198, Cl. 71-1.000.

Bardsley, Frank Baxter: *See—*
Neville, Richard Ernest Gartside; and Bardsley, Frank Baxter, 3,978,987.

Barker, George E.; Cohen, Stephen C.; O'Brien, John L.; and Milgrom, Jack, to Van Straaten Chemical Company. Metal cold forming process and lubricant composition therefor. 3,978,702, Cl. 72-42.000.

Barnes, Miles J., to Food Automation Service Techniques, Inc. Multiproduct cooking computer. 3,979,056, Cl. 235-92.0MT.

Barnum, Ronald E.; Tefft, Franklin A.; and Cotton, Louis S., to United Technologies Corporation. Helicopter warning system. 3,979,717, Cl. 340-27.00R.

Barnum, Thomas G., to Bradley Corporation. Flow control cam. 3,978,890, Cl. 137-636.400.

Barrett, Donald F.: *See—*
Herbert, Roger B.; Horowitz, Harvey A.; and Barrett, Donald F., 3,979,080.

Barry, John P.: *See—*
Dettling, Joseph R.; and Barry, John P., 3,979,052.

Barton, Serge P.; and Berry, William R., to Westinghouse Electric Corporation. Temperature measuring device having a deformable temperature sensing head thereof. 3,979,229, Cl. 136-232.000.

Bartzsch, Henning, to Kali-Chemie Aktiengesellschaft. Pelleted sulfur compositions and processes for their production. 3,979,316, Cl. 252-189.000.

Bascou, Jacques, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Luggage boot lid lock for motor vehicle. 3,979,144, Cl. 292-216.000.

BASF Aktiengesellschaft: *See—*
Burdorf, Donald L., 3,979,037.

Basile, Giampiero: *See—*
Montiglio, Ugo; Basile, Giampiero; Aspes, Pierfrancesco; and Gallinotti, Elio, 3,979,310.

Bassett, Melvin C.: *See—*
Zumalt, Michael D.; Hofmann, Neil R.; and Bassett, Melvin C., 3,979,182.

Bastgen, Wendell, to Albert Klein KG. Filter. 3,979,296, Cl. 210-324.000.

Bate, Robert T., to Texas Instruments Incorporated. Infrared charge-coupled imager. 3,979,604, Cl. 307-221.00D.

Batzer, Hans: *See—*
Schmid, Rolf; Lohse, Friedrich; Fatzer, Willy; and Batzer, Hans, 3,979,477.

Baugh, Hilton. Drafting system and apparatus. 3,978,587, Cl. 33-77.000.

Baxter Laboratories, Inc.: *See—*
Ebling, Wendell V.; Goldsmith, Herbert; and Rodriquez, Rodolfo R., 3,979,665.

Bayer Aktiengesellschaft: *See—*
Buttner, Gerhard; Klauke, Erich; Frohberger, Paul-Ernst; and Hammann, Ingeborg, 3,979,411.
Kolbe, Joachim; Schneider, Otto; Gutschik, Ernst; and Brokmeier, Dieter, 3,979,544.
Krimm, Heinrich; Buysch, Hans-Josef; and Freitag, Dieter, 3,979,462.
Perrey, Hermann; Welz, Harry; Lange, Ralf; Rudolph, Hans; and Rosenkranz, Hans Jurgen, 3,979,454.
Ruland, Dieter, 3,979,299.
Seidler, Helmut; Wunderlich, Klaus; Bien, Hans-Samuel; and Leister, Heinrich, 3,979,413.
Stolzer, Claus; Hammann, Ingeborg; and Unterstenhofer, Gunter, 3,979,512.
Timmler, Helmut; and Lurssen, Klaus, 3,979,204.
Zecher, Wilfried; and Merten, Rudolf, 3,979,421.

Bayne, Peter D., to Logica International Corporation. Method of cold sterilization and preservation of food products using dimethyl dicarbonate. 3,979,524, Cl. 426-305.000.

BBC Brown Boveri & Company Limited: *See—*
Scherer, Fridolin, 3,979,187.

Beals, Eugene C.: *See—*
Swan, Arnold H.; and Beals, Eugene C., 3,978,535.

Beard, Colin C., to Syntex (U.S.A.) Inc. 2-Substituted-1,2,4-thiadiazolo-[2,3-a]-imidazoles. 3,979,404, Cl. 260-306.80F.

Beard, Walter C., to Aerosol Techniques Incorporated. Cleaning and scrubbing tool. 3,979,163, Cl. 401-139.000.

Bednar, Vladimir. Headgear. 3,978,527, Cl. 2-68.000.

Bee Plastics Corporation: *See—*
Thornbloom, Bruce Norman, Jr., 3,979,007.

Beelitz, Howard Raymond; and Preslar, Donald Ray, to RCA Corporation. Electrical circuit. 3,979,607, Cl. 307-237.000.

Bekes nee Erdos, Judit: *See—*
Johan, Bela; Szemler, Laszlo; Szontagh, Tamas; Kuti, Laszlo; Simonovits, Emilia; Bekes nee Erdos, Judit; Szekely, Denes; Kiss, Janos; Kovacs nee Komoroczy, Erzsebet; and Hargitai nee Franyo, Aniko, 3,979,259.

Belart, Juan, to ITT Industries, Inc. Servo-power-assisted hydraulic brake-actuating arrangement. 3,978,669, Cl. 60-549.000.

Beling, Thomas E.; Morin, John O.; and Yanikoski, Florian F., to SIGMA Instruments, Inc. Selective positioning system particularly for controlling guide bars of knitting machines. 3,978,690, Cl. 66-205.000.

Bell Telephone Laboratories, Incorporated: *See—*
Fraser, Alexander Gibson, 3,979,733.
Goldhar, Julius; and Yablonovitch, Eli, 3,979,694.
Ngo, Peter Dinh-Tuan, 3,979,638.
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Saari, Veikko Reynold, 3,979,693.

Belli, Frank G.: *See—*
Buckley, David A.; and Belli, Frank G., 3,979,210.

Belmont, Peter A. Adjustably-weighted golf irons and processes. 3,979,122, Cl. 273-171.000.

Belmont, Peter A. Golf club heads and process. 3,979,123, Cl. 273-171.000.

Beloglazov, Alexandr Petrovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Bolko, Georgy Alexandrovich; Kumysh, Ilya Iosifovich; Puzrin, Leonid Gustavovich; Kovalev, Viktor Alexandrovich; Marinsky, Georgy Sergeevich; Beloglazov, Alexandr Petrovich; Siry, Pavel Osipovich; Sopozhnikov, Alexandr Ivanovich; Nosanov, Valentin Alexandrovich; Babinovich, Volf Iudovich; Popov, Lev Vasilievich; Shelkov, Sergei Mikhailovich; Strukov, Vladimir Nikolaevich; and Babich, Boris Markovich, 3,979,101.

Bendix Corporation, The: *See—*
Vick, Ralph L., 3,978,891.

Benedek, Eva: *See—*
Harsanyi, Kalman; Takacs, Kalman; Kiss, Pal; Szekeres, Laszlo; Papp, Gyula; and Benedek, Eva, 3,979,397.

Bennett, George H.; and Pringle, Wilbur L., to National-Standard Company. Sickle guard. 3,978,645, Cl. 56-310.000.

Bennett, Thomas H.; Carlow, Earl F.; and Wiles, Michael F., to Motorola, Inc. Interface adaptor having control register. 3,979,730, Cl. 340-172.500.

Benning, Anton: *See—*
Handrick, Kurt; Benning, Anton; George, Dietrich; and Schlegel, Jurgen, 3,979,448.

Benoist, Jean-Charles; Bitsch, Francois; and Tarel, Gerard Rene Joseph, to Electronique Marcel Dassault. Apparatus for phase keying in frequency and phase voltage controlled oscillator with an incoming signal having a T period, and phase coded of the biphase PCM type or PSK type. 3,979,692, Cl. 331-1.00A.

Bensinger, Wolf-Dieter; Worner, Gunter; and Kurz, Dietrich, to Daimler-Benz Aktiengesellschaft. Rotary piston internal combustion engine of trochoidal construction. 3,978,824, Cl. 123-8.090.

Beny, Janos: *See—*
Rose, Bernard R.; Meggs, Daniel H.; and Beny, Janos, 3,978,598.

Benz & Hilgers GmbH: *See—*
Reinecke, Gunter, 3,979,021.

Berezova, Ljudmila Vasilievna: *See—*
Moskovich, Jury Leonidovich; Juriev, Jury Nikolaevich; Tsyskovsky, Viktor Karlovich; Berezova, Ljudmila Vasilievna; Gilchenok, Nokhum Davidovich; Yanshevsky, Vladimir Avgustovich; Mushenko, Dmitry Vasilievich; Zelikman, Evgeny Semenovich; Filippova, Rufina Alexandrovna; Klimenko, Vladi-

mir Leonidovich; and Sobolev, Valerian Mikhailovich, 3,979,450.

Berezovskaya, Elena Nikolaevna: *See—*
Golovko, Georgy Anatolievich; Lipkind, Boris Alexandrovich; Slepneva, Albina Timofeevna; Leontiev, Alexandr Semenovich; Mazin, Vladimir Mikhailovich; Berezovskaya, Elena Nikolaevna; Burylov, Valentin Alexandrovich; Zubkov, Alexandr Mikhailovich; Konakova, Olga Alexeevna; Judaev, Alexandr Ivanovich; Pavlychev, Valentin Nikolaevich; Ignatov, Jury Yakovlevich; and Kharitonov, Evgeny Alexandrovich, 3,979,335.

Berg, Robert M. Beach cleaning apparatus. 3,979,146, Cl. 294-55.000.

Berg, Thomas L. Method and apparatus for decorating articles. 3,979,247, Cl. 156-297.000.

Berger, Barry D., to Thomson-Leeds, Company, Inc. Illuminated display device. 3,978,599, Cl. 40-132.00R.

Bergishagen, Finn: *See—*
Sternberg, Stanley R.; Young, James E.; and Lennington, John W., 3,979,589.

Bergwerksverband GmbH: *See—*
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Munzner, Heinrich; Heimbach, Heinrich; Korbacher, Werner; Peters, Werner; Juntgen, Harald; Knoblauch, Karl; and Zundorf, Dieter, 3,979,330.

Beriger, Ernst; and Drabek, Jozef, to Ciba-Geigy Corporation. O,S-Dialkyl-O-(1-methoxyphenyl-2-halovinyl)-dithiophosphates. 3,979,484, Cl. 260-951.000.

Bernard, Derek John Charles: *See—*
Hickman, Ronald P.; Luff, Brian Anthony; Rossell, Edgar Ronald; and Bernard, Derek John Charles, 3,978,944.

Bernt, Erich; Gruber, Wolfgang; Haid, Erich; Stahler, Fritz; Wahlefeld, August Wilhelm; and Weimann, Gunter, to Boehringer Mannheim G.m.b.H. γ-Glutamyl-4-nitroanilide compounds. 3,979,447, Cl. 260-518.00R.

Berry, William R.: *See—*
Barton, Serge P.; and Berry, William R., 3,979,229.

Bertario, Luigi, to Alluminio Mauceri Borghetto S.p.A. Bottle cap. 3,979,004, Cl. 215-341.000.

Bertholet, Raymond: *See—*
Hirsbrunner, Pierre; and Bertholet, Raymond, 3,979,449.

Bettiol, Bruno, to Essilor International "Cie Generale D'Optique". Variable-profile cam, especially for a reproducing machine. 3,978,741, Cl. 74-568.00R.

Betzien, Gunter: *See—*
Rothe, Werner; Heinemann, Helmut; Schmidt, Felix Helmut; and Betzien, Gunter, 3,979,520.

Beyer, William F.; and Dankert, Harry S., to Upjohn Company, The. Method and device for extracting filter frits from liquid chromatographic columns. 3,978,575, Cl. 29-427.000.

Beynet, Pierre A.; and Dixon, David A., to Amoco Production Company. Riser spacers for vertically moored platforms. 3,978,804, Cl. 114-.50D.

Bhattacharyya, Arup; Joshi, Madhukar Laxman; Kroll, Charles Thomas; and Silverman, Ronald, to International Business Machines Corporation. Fixed and variable threshold N-channel MNOSFET integration technique. 3,978,577, Cl. 29-571.000.

Bianchi, Gaudenzio: *See—*
Radici, Pierino; Bianchi, Gaudenzio; Colombo, Daniele; and Colombo, Paolo, 3,979,479.
Radici, Pierino; Bianchi, Gaudenzio; and Colombo, Paolo, 3,979,481.

Bien, Hans-Samuel: *See—*
Seidler, Helmut; Wunderlich, Klaus; Bien, Hans-Samuel; and Leister, Heinrich, 3,979,413.

Biggs, Charles L., Jr. Apparatus for broadcasting granular material. 3,979,071, Cl. 239-653.000.

Bilgrei, Michael. Water level sensing device having rupturable hygroscopic-type switch actuator. 3,979,569, Cl. 200-61.040.

Billion S.A.: *See—*
Monnet, Bernard Leon, 3,979,170.

Billiton Research B.V.: *See—*
Middelhoek, Servaas; and Baan, Diederich J., 3,979,206.

Biochemie Gesellschaft m.b.H.: *See—*
Riedl, Kurt, 3,979,423.

Biofeedback Computers, Inc.: *See—*
Fehmi, Lester G.; and Schneider, Joseph R., 3,978,847.

Bioteknika International, Inc.: *See—*
Prudom, Carolina M., 3,979,283.

Birchall, Donald Jack. Apparatus for the detection of vibration in rotating machinery. 3,979,739, Cl. 340-261.000.

Bishop, Allen J., to Westronics, Inc. System and method for linearizing analog measurements during analog-to-digital conversion. 3,979,745, Cl. 340-347.0NT.

Bissell, Inc.: *See—*
Yonkers, Robert A., 3,978,539.

Bite, Pal: *See—*
Toth, Istvan Tibor; Bite, Pal; Magyar, Gyorgy; Diszler, Eszter; Borsy, Jozsef; Maderspach, Andrea; Polgari, Istvan; Elek, Sandor; and Elekes, Istvan, 3,979,405.

Bitsch, Francois: *See—*
Benoist, Jean-Charles; Bitsch, Francois; and Tarel, Gerard Rene Joseph, 3,979,692.

Blandin, Jacques H.: *See—*
Herchin, Michel A.; and Blandin, Jacques H., 3,979,486.

Bliss, Robert A., to Hoerner Waldorf Corporation. Dispensing closure for tissue carton. 3,979,019, Cl. 221-48.000.

Block, William V.: *See—*
Chang, Edward H.; Block, William V.; and Gruss, Mark L., 3,979,219.

Bloomfield Industries, Inc.: *See—*
Roberts, Melvin F., 3,978,778.
Roberts, Melvin F., 3,979,221.

Bloomfield, Jordan J., to Monsanto Company. Chemical regulation of plant growth. 3,979,201, Cl. 71-91.000.

Blount, David H. Process for the production of silico-amino compounds and their condensation products. 3,979,362, Cl. 260-67.60R.

Bochan, John, to General Electric Company. Delayed-action centrifugal clutch transmission. 3,978,956, Cl. 192-105.00A.

Boddeker, Hans-Joachim; and Konig, Rolf, to Hazemag Dr. E. Andreas KG. Beater bar for rotors of impact mills. 3,979,078, Cl. 241-191.000.

Boehringer Mannheim G.m.b.H.: *See—*
Bernt, Erich; Gruber, Wolfgang; Haid, Erich; Stahler, Fritz; Wahlefeld, August Wilhelm; and Weimann, Gunter, 3,979,447.
Rothe, Werner; Heinemann, Helmut; Schmidt, Felix Helmut; and Betzien, Gunter, 3,979,520.

Boeing Company, The: *See—*
Herbes, Edwin James; and Riggs, Ray Vere, 3,978,975.
Robinson, Robert K.; and Whitener, Philip C., 3,979,005.
Sandelius, John Robert, 3,978,790.

Bogdanovicz, Ladislav: *See—*
Muck, Eduard; Horak, Josef; Strachota, Jaroslav, deceased; Boleslav, Jiri; Grygera, Lubomir; Bogdanovicz, Ladislav; and Hvezda, Otto, 3,979,532.

Bogert, Clayton. Safety closure for containers. 3,979,001, Cl. 215-217.000.

Bohning, Oliver D., to Rockwell International Corporation. Sense circuit arrangement. 3,979,600, Cl. 307-125.000.

Boiko, Georgy Alexandrovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Boiko, Georgy Alexandrovich; Kumysh, Ilya Iosifovich; Puzrin, Leonid Gustavovich; Kovalev, Viktor Alexandrovich; Marinsky, Georgy Sergeevich; Beloglazov, Alexandr Petrovich; Siry, Pavel Osipovich; Sopozhnikov, Alexandr Ivanovich; Nosanov, Valentin Alexandrovich; Babinovich, Volf Iudovich; Popov, Lev Vasilievich; Shelkov, Sergei Mikhailovich; Strukov, Vladimir Nikolaevich; and Babich, Boris Markovich, 3,979,101.

Boleslav, Jiri: *See—*
Muck, Eduard; Horak, Josef; Strachota, Jaroslav, deceased; Boleslav, Jiri; Grygera, Lubomir; Bogdanovicz, Ladislav; and Hvezda, Otto, 3,979,532.

Boman, Karl Gunnar, to Sandco Ltd. Apparatus for dispensing pourable substances uniformly onto belts having highly sensitive surfaces. 3,979,030, Cl. 222-415.000.

Bond, Jesse H. Toothpick. 3,978,872, Cl. 132-89.000.

Bondra, John, Jr.; and Ruhling, William R., to Metal Buildings Insulation, Inc. Insulation blanket and method and apparatus for making same. 3,979,245, Cl. 156-184.000.

Boone, Jay D., to United States of America, Navy. Energy absorbing tear-webbing. 3,978,894, Cl. 139-383.00R.

Boone, Theodore F.: *See—*
Joscher, Alfred J.; and Boone, Theodore F., 3,978,938.

Booth, Clyde C. Burial facility. 3,978,627, Cl. 52-136.000.

Borden, George Wayne: *See—*
Trecker, David John; Borden, George Wayne; and Smith, Oliver Wendell, 3,979,270.

Borden, Inc.: *See—*
Lemon, Peter Herbert Richard Bryan, 3,978,906.

Borden Products Limited: *See—*
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Borgersen, Bruce R.: *See—*
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Borgman, Milton H.: *See—*
Trifunovic, Alexander L.; Hills, William H.; Borgman, Milton H.; and Mersereau, Emory P., 3,978,561.

Boris, Paul A.; and Marx, Jon A., to United Technologies Corporation. Engine mount. 3,979,087, Cl. 244-54.000.

Borsy, Jozsef: *See—*
Toth, Istvan Tibor; Bite, Pal; Magyar, Gyorgy; Diszler, Eszter; Borsy, Jozsef; Maderspach, Andrea; Polgari, Istvan; Elek, Sandor; and Elekes, Istvan, 3,979,405.

Borysiewicz, Richard: *See—*
Roedel, Charles William; Borysiewicz, Richard; So, Richard Tan; and Swan, Larry Wayne, 3,979,559.

Bothwell, Peter William. Head and chest protectors for example for motor cyclists. 3,978,525, Cl. 2-424.000.

Boucher, Andre, to U.S. Philips Corporation. Depositing doped material on a substrate. 3,979,235, Cl. 148-175.000.

Boudreaux, Gordon J.: *See—*
Moreau, Jerry P.; Chance, Leon H.; Boudreaux, Gordon J.; and Drake, George L., Jr., 3,979,533.

Boulenger, Paul, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Apparatus for the purification of effluent. 3,979,293, Cl. 210-96.00R.

Bouyoucos, John V., to Hydroacoustics Inc. Acoustic source. 3,978,940, Cl. 181-120.000.

Braber, Robert J.; and Weber, Paul L. Article dispensing container. 3,979,020, Cl. 221-63.000.

Bradley Corporation: *See—*
Barnum, Thomas G., 3,978,890.

Brady, John W.; Strickland, Franklin D.; and Longwith, Chester C., to Shanco Plastics & Chemicals Inc. Aqueous base-soluble resin compositions. 3,979,352, Cl. 260-33.40R.

Braginski, Aleksander I., to Westinghouse Electric Corporation. Bistable magnetic bubble domain devices. 3,979,737, Cl. 340-174.0TF.

Brand, Warren L., to Signetics Corporation. Silicon gate MOS device and method. 3,979,765, Cl. 357-23.000.

Branson, Charles D.; and Demi, Roy C., to Robertshaw Controls Company. Fuel control system and control device therefor or the like. 3,979,103, Cl. 251-97.000.

Braus, Harry; and Woltermann, Jay R., to National Distillers and Chemical Corporation. Synthetic fiber impregnated with flame retardant compositions containing halogen containing amides. 3,979,545, Cl. 428-392.000.

Brecher, Charles: *See—*
Feuersanger, Alfred E.; and Brecher, Charles, 3,979,738.

Bregoli, Lawrence J.: *See—*
Smith, Stanley W.; and Bregoli, Lawrence J., 3,979,225.

Brennan, Ambrose K., Jr.; and Whisler, Norris H., to Teledyne Industries, Inc. Apparatus and method for machining continuous mixer agitators and the like. 3,978,766, Cl. 90-24.500.

Brewing Patents Limited: *See—*
Laws, Derek Roy James; and Pickett, John Anthony, 3,979,527.

Breysse, Jacques; and Roget, Jean, to Rhone-Poulenc S.A. Fluid separating apparatus. 3,979,298, Cl. 210-232.000.

Brezette, Michael Warren, to Abbott Laboratories. Catheterization tray with lubrication channel. 3,978,983, Cl. 206-364.000.

Brickner, David R.; and Johnson, James S., to Sperry Rand Corporation. Velocity damped erection system for stable gyroscopic attitude and heading reference apparatus. 3,979,090, Cl. 244-175.000.

Bridgestone Tire Company Limited: *See—*
Fujisawa, Masao, 3,979,142.

Bright, William L. Bolt and process of forming same. 3,978,758, Cl. 85-9.00R.

Bringol, Charles Ronald, to International Business Machines Corporation. Direct current and synchronous motor system. 3,979,651, Cl. 318-138.000.

Briones, Antonio Gamero: *See—*
Martinez-Alvarez, Francisco; Briones, Antonio Gamero; and Buron, Enrique Dominguez, 3,979,382.

Brokmeier, Dieter: *See—*
Kolbe, Joachim; Schneider, Otto; Gutschik, Ernst; and Brokmeier, Dieter, 3,979,544.

Brotz, Walter; and Mader, Fred, to Hoechst Aktiengesellschaft. Lubricant containing poly(vinyl chloride) molding composition. 3,979,347, Cl. 260-28.50D.

Brown, Dwight C.; and Brown, Kevin B. Sandals and method of making same. 3,978,596, Cl. 36-11.500.

Brown, Kevin B.: *See—*
Brown, Dwight C.; and Brown, Kevin B., 3,978,596.

Brown, William J., to Caterpillar Tractor Co. Hinge disconnect means for a door. 3,978,550, Cl. 16-171.000.

Bruckner, Carl-Heinz; and Simeth, Claus, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Sheet lock for feed table in printing press. 3,979,115, Cl. 271-261.000.

Brudnak, Andrew, Jr., to International Harvester Company. Draft sensing elevating scraper with automatic elevator speed control. 3,978,597, Cl. 37-8.000.

Brunswick Corporation: *See—*
Harris, Mark, 3,979,664.

Bryant, Earle Ruskin; and Weis, Joseph August, to Inmont Corporation. Vulcanizable silicon terminated polyurethane polymer composition having improved cure speed. 3,979,344, Cl. 260-18.0TN.

Bryce, Rodney Harold; Edel, Alfred; and Randpalu, Adu, to Dominion Engineering Works, Limited. Calendar control system. 3,978,784, Cl. 100-170.000.

Bucalo, Louis, to Microbyx Corporation. Method for growing cultures in a body cavity in the presence of gas. 3,979,263, Cl. 195-103.50R.

Buchi, George Hermann; Wuest, Hans; Ohloff, Gunther; and Strickler, Hugo, to Firmenich S.A. Process for the preparation of unsaturated aldehydes. 3,979,425, Cl. 260-348.00R.

Buchman, William W., to Hughes Aircraft Company. Laser pumping cavity with polycrystalline powder coating. 3,979,696, Cl. 331-94.50P.

Buckeye Molding Co.: *See—*
Allen, David O., 3,979,003.

Buckley, David A.; and Belli, Frank G., to Xerox Corporation. Migration imaging member employing a surface skin. 3,979,210, Cl. 96-1.500.

Buckley, Richard D.; and Hilko, John, to Westinghouse Electric Corporation. Circuit breaker having members coated with phosphate-chromate protective layers. 3,979,704, Cl. 335-6.000.

Buckley, Stephen P.; and Patigalia, Edward N., to United States of America, Army. Liner insertion apparatus. 3,978,775, Cl. 93-77.0CL.

Buderus'sche Eisenwerke Aktiengesellschaft: *See—*
Durth, Wilfried, 3,978,843.

Buerger, Heinz. Band for carrying out microbiological examinations. 3,979,264, Cl. 195-139.000.

Bulgier, Lawrence Ware; and Musick, Charles Ronald, to Combustion Engineering, Inc. Method for operating a system with a variable excursion margin setpoint. 3,979,255, Cl. 176-20.00R.

Buljan, Sergej-Tomislav: *See—*
Fritsch, Carl W., Jr.; and Buljan, Sergej-Tomislav, 3,979,216.

Bullock, Milon Walker; and Walworth, Bryant Leonidas, to American Cyanamid Company. Sulfonamido herbicidal compositions and plant control methods using the same. 3,979,203, Cl. 71-103.000.

Bunker Ramo Corporation: *See—*
Kwan, Okun, 3,978,964.

Burd, Samuel: *See—*
Fettel, Bruce E.; and Burd, Samuel, 3,978,863.

Burden, Alfred L.: *See—*
Rhodes, Charles W., 3,978,701.

Burdorf, Donald L., to BASF Aktiengesellschaft. Air guide for tape transports. 3,979,037, Cl. 226-97.000.

Burgers, Bernhardus Walter Antonius; and Teulings, Wilhelmus Antonius, to Hollandse Signaalapparaten B.V. Pulse radar apparatus. 3,979,678, Cl. 325-184.000.

Buritz, Robert S.: *See—*
Schwider, Alfred W.; Burnham, John; and Buritz, Robert S., 3,979,530.

Burk, Emmett H., Jr.; and Carlos, Donald D., to Atlantic Richfield Company. Polyfunctional aliphatic and cycloaliphatic cyclic nitrile sulfites and carbonates. 3,979,401, Cl. 260-301.000.

Burke, Roger A.; and Somogyi, Bela, to Hughes Aircraft Company. Solderless contact for electronic watch. 3,978,653, Cl. 58-23.00R.

Burklund, Vernon D.: *See—*
Miller, Ray A.; Dillinger, Robert B.; Stone, W. James; and Burklund, Vernon D., 3,979,089.

Burnham, John: *See—*
Schwider, Alfred W.; Burnham, John; and Buritz, Robert S., 3,979,530.

Burnight, Thomas R.; and Holtkamp, Donald A., to Clark Equipment Company. Mechanical piston retention for free wheeling. 3,978,771, Cl. 91-491.000.

Burns, Richard H.; and Walthour, William J., to Hobart Corporation. Microwave oven door hinge. 3,979,573, Cl. 219-10.55D.

Buron, Enrique Dominguez: *See—*
Martinez-Alvarez, Francisco; Briones, Antonio Gamero; and Buron, Enrique Dominguez, 3,979,382.

Burr, John F.: *See—*
Jamison, Will B.; and Burr, John F., 3,979,650.

Burrows, Leonard H.: *See—*
Smith, Jack R.; and Burrows, Leonard H., 3,978,659.

Burylov, Valentin Alexandrovich: *See—*
Golovko, Georgy Anatolievich; Lipkind, Boris Alexandrovich; Slepneva, Albina Timofeevna; Leontiev, Alexandr Semenovich; Mazin, Vladimir Mikhailovich; Berezovskaya, Elena Nikolaevna; Burylov, Valentin Alexandrovich; Zubkov, Alexandr Mikhailovich; Konakova, Olga Alexeevna; Judaev, Alexandr Ivanovich; Pavlychev, Valentin Nikolaevich; Ignatov, Jury Yakovlevich; and Kharitonov, Evgeny Alexandrovich, 3,979,335.

Bush, John A.; Lance, Drew R.; and Altstatt, John E., to California Microwave, Inc. FM demodulator having squelch circuit using bucket brigade delay line. 3,979,679, Cl. 325-348.000.

Bushell, Brian John: *See—*
Newberry, Robert Anthony; and Bushell, Brian John, 3,979,402.

Buskine S.A.: *See—*
Taccone, Ida, 3,979,395.

Butter, Stephen A., to Mobil Oil Corporation. Process for manufacturing hydrocarbons. 3,979,472, Cl. 260-668.00R.

Buttner, Gerhard; Klauke, Erich; Frohberger, Paul-Ernst; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. 2-Trifluoromethylimino-benzo-heterocyclic compounds. 3,979,411, Cl. 260-327.00M.

Buysch, Hans-Josef: *See—*
Krimm, Heinrich; Buysch, Hans-Josef; and Freitag, Dieter, 3,979,462.

Buzhinsky, Igor Mikhailovich: *See—*
Alexeev, Nikolai Efimovich; Buzhinsky, Igor Mikhailovich; Zhabotinsky, Mark Efremovich; Izyneev, Anatoly Andreevich; Koryagina, Elizaveta Ivanovna; Kravchenko, Valery Borisovich; Rudnitsky, Jury Petrovich; Gapontsev, Valentin Pavlovich; and Tsapkin, Vadim Vasilievich, 3,979,322.

Bykowski, Michael J.; and Ewing, Lloyd, to Water Pollution Control Corporation. Filtration method. 3,979,289, Cl. 210-79.000.

Byron Jackson, Inc.: *See—*
Howard, James A., 3,978,993.

C. Reichert Optische Werke AG: *See—*
Lechner, Gunther; and Pauliny, Ferdinand, 3,978,686.

Cabot Corporation: *See—*
Zachman, Neil J., 3,978,744.

Caldwell, Edward N., to Robertshaw Controls Company. Valve construction and improved parts for the same or the like. 3,979,129, Cl. 277-110.000.

California Microwave, Inc.: *See—*
Bush, John A.; Lance, Drew R.; and Altstatt, John E., 3,979,679.

Calvert, Neil S.: *See—*
Fulton, Robert J.; Calvert, Neil S.; and Valler, Joseph W., 3,979,033.

Calzadilla, Elio A., to Faaca Inc. Modified evaporator for automobile air conditioning systems. 3,978,687, Cl. 62-525.000.

Cameron, J. F. Ross: *See—*
Plemons, Robert F.; Staff, Charles H.; and Cameron, J. F. Ross, 3,979,525.

Cameron, Neil McIver; Thatcher, Kenneth Cyril; and Mallinder, Frederick Paul, to Fibreglass Limited. Method for producing glass fiber reinforcing members. 3,979,493, Cl. 264-145.000.

Campbell, David O., to United States of America, Energy Research and Development Administration. Recovery of cesium and palladium from nuclear reactor fuel processing waste. 3,979,498, Cl. 423-2.000.

Campbell, Thomas C.: *See—*
DuBell, Thomas L.; Campbell, Thomas C.; and Thompson, James L., 3,978,662.

Campoli, Ralph F.; Steiner, Edwin G.; Purtilo, Dennis L.; and Lynch, Thomas A., to United States of America, Army. Projectile-to-cartridge case attachment. 3,978,792, Cl. 102-38.000.

Camsco, Inc.: *See—*
Leslie, Elmer N.; and Higgins, Bobby L., 3,978,748.

Canadian General Electric Company Limited: *See—*
Rynard, Richard Haig John, 3,979,574.
Whiteley, Eric, 3,979,619.
Whiteley, Eric, 3,979,620.

Candida, Domenic, to Vernitron Corporation. Control circuit for a character segment display assembly. 3,979,747, Cl. 340-373.000.

Canney, Robert S., to General Electric Company. End cap for primary windings. 3,978,548, Cl. 16-109.000.

Cano, Joseph: *See—*
de Lama, Alberto; and Cano, Joseph, 3,978,905.

Cantone, Thomas: *See—*
Rasoulinejad, Seyd M., 3,978,600.

Cappel, Bert; Schuhmann, Siegfried; and Wolf, Klaus, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Ink metering assembly for printing press. 3,978,788, Cl. 101-363.000.

Captain International Industries, Inc.: *See—*
O'Toole, Francis Charles; and Comeau, Charles Philip, 3,979,017.

Caragliano, Edward S.; and Nick, Howard H., to International Business Machines Corporation. Directional coupler cascading for signal enhancement. 3,979,699, Cl. 333-10.000.

Card & Co., Inc.: *See—*
Card, Roy T.; and Hill, Rodney E., 3,978,800.

Card, Roy T.; and Hill, Rodney E., to Card & Co., Inc. Needle bar foot construction for multiple needle skip-stitch tufting machine. 3,978,800, Cl. 112-79.00R.

Carlos, Donald D.: *See—*
Burk, Emmett H., Jr.; and Carlos, Donald D., 3,979,401.

Carlow, Earl F.: *See—*
Bennett, Thomas H.; Carlow, Earl F.; and Wiles, Michael F., 3,979,730.

Caron, LaVerne Andrew: *See—*
Crail, Frederick William; and Caron, LaVerne Andrew, 3,978,833.

Carrara, Marcel Vincent, to General Electric Company. Continuous casting apparatus with an articulative sealing connection. 3,978,815, Cl. 118-69.000.

Carrier Corporation: *See—*
Geary, Carl H., 3,979,128.
Sood, Vijay K.; and Streifert, Keith L., 3,979,155.

Carter, Brian H.: *See—*
Firnhaber, Bernhard E.; Chute, Robert E.; and Carter, Brian H., 3,979,470.

Carter, Cecil O., to Phillips Petroleum Company. Recovery of HF and ethyl fluoride from alkylation of isoparaffin with olefins in presence of HF catalyst. 3,979,475, Cl. 260-683.420.

Caterpillar Tractor Co.: *See—*
Brown, William J., 3,978,550.
Dauwalder, Fred R., 3,978,935.
Day, Ralph R., 3,978,769.
Groff, Eugene R., 3,979,154.
Kelly, Kenneth W.; and Peterson, Wayne A., 3,978,666.
Kuhn, Charles W., 3,979,292.
Penny, Robert Noel; and Waters, Peter James, 3,978,912.
Ream, Michael D., 3,978,946.
Weber, Robert L., 3,978,828.

Cath, Pieter G.; and Erdman, Robert J., to Keithley Instruments, Inc. Electronic protective circuit. 3,979,642, Cl. 317-16.000.

Catron, Brittain Norman; Dumstorff, Eugene Francis; Schloss, Phillip Christian; and Schroeder, Larry Lloyd, to International Business Machines Corporation. Memory access control circuit. 3,979,727, Cl. 340-172.500.

Catron, H. Wayne. Display frame with retractable garment support. 3,978,601, Cl. 40-322.000.

Caveng, Jean-Claude: *See—*
De Ruyter, Jackie Andre; and Caveng, Jean-Claude, 3,978,951.

Ceccaldi, Maurice; and Roubeau, Pierre, to Commissariat a l'Energie Atomique. Windowless cryostatic device for low-temperature spectrometry. 3,979,325, Cl. 250-352.000.

Cecchetti, Claudio. Game board structure. 3,979,119, Cl. 273-121.00R.

Celanese Corporation: *See—*
MacLean, Alexander F.; and Kalniv, Ilmar L., 3,979,666.

Centre Technique du Bois: *See—*
Heron, Pierre D., 3,979,075.

Cessna Aircraft Company, The: *See—*
Gonzalez, Cesar, 3,978,671.

Chaikin, Saul W., to Xidex Corporation. Vesicular image transfer process. 3,979,211, Cl. 96-29.00R.

Chalkley, Hatcher E.: *See—*
Tooley, John R.; Scott, Larry D.; and Chalkley, Hatcher E., 3,979,719.

Chambers, Henry B.; Tellefson, Clair W.; and Balsillie, Tony H., to Hydranautics. Ship lifting apparatus. 3,978,676, Cl. 61-65.000.

Chance, Leon H.: *See—*
Moreau, Jerry P.; Chance, Leon H.; Boudreaux, Gordon J.; and Drake, George L., Jr., 3,979,533.

Chang, Edward H.; Block, William V.; and Gruss, Mark L., to Fremont Industries, Inc. Wood finish remover. 3,979,219, Cl. 106-271.000.

Charbonnages de France: *See—*
Chauvin, Raymond, 3,979,168.

Charlot, Jean-Claude, to Thomson-CSF. Pulse-type radar with modulated carrier frequency. 3,979,752, Cl. 343-17.20R.

Chase Brass and Copper Co., Inc.: *See—*
Ruhl, Robert C.; and Johnson, James E. (said Robert C. Ruhl assors. to), 3,979,084.

Chase-Shawmut Company, The: *See—*
Healey, Daniel P., Jr., 3,979,709.

Chatterton, James. Dry foam producing apparatus. 3,979,326, Cl. 252-359.00E.

Chauvin, Raymond, to Charbonnages de France; and Houilleres du Bassin du Nord et du Pasde-Calais. Apparatus for the manufacture of light granulates. 3,979,168, Cl. 425-6.000.

Checki, Angelo Daniel, Jr.; and Frey, Anton Griswold, to RCA Corporation. Automatic assembly of semiconductor devices. 3,978,579, Cl. 29-589.000.

Chemische Werke Huls Aktiengesellschaft: *See—*
Zerrweck, Willy, 3,979,474.

Chemsoil Corporation: *See—*
Collins, Dwight D.; and Lauer, Fred W., Jr., 3,979,199.

Chen, Chun-Fu; and Hague, Duane O., Jr., to University of Akron, The. Digital control system and method for the synchronization of audio-visual equipment. 3,979,774, Cl. 360-80.000.

Cheng, Dah Yu, to International Power Technology. Parallel-compound dual-fluid heat engine. 3,978,661, Cl. 60-39.550.

Cheng, King Y.: *See—*
Motley, David M.; Cheng, King Y.; and Middlestead, Richard W., 3,979,685.

Chesluk, Ralph P.: *See—*
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Chevron Research Company: *See—*
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Chichester, Willard L.; and Holtkamp, Donald A., to Clark Equipment Company. Hydrostatic propulsion system. 3,978,937, Cl. 180-44.00F.

Child, Terence Frederick, to Lever Brothers Company. Detergent compositions. 3,979,314, Cl. 252-140.000.

Chin, Arthur H. T.: *See—*
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Chinoin Pharmaceutical and Chemical Works Ltd.: *See—*
Harsanyi, Kalman; Takacs, Kalman; Kiss, Pal; Szekeres, Laszlo; Papp, Gyula; and Benedek, Eva, 3,979,397.

Chisso Corporation: *See—*
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Chistyakov, Sergei Petrovich: *See—*
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Chloride Group Limited: *See—*
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Cho, Mayumi, to Pioneer Electronic Corporation. 4-Channel stereo recording and reproducing method. 3,979,564, Cl. 179-100.4ST.

Choate, Paul V.: *See—*
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Chrepta, Metro M.; and Jacobs, Harold, to United States of America, Army. Method of producing semiconductor devices with minority charge carriers having a long lifetime and devices produced thereby. 3,979,272, Cl. 204-192.000.

Christensen, Burton G.: *See—*
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Christensen, Dale A.; Ostrom, Carl R.; and Frankenstein, Ronald L., to Valmont Industries, Inc. Peripheral water balance control for center pivot irrigation system. 3,979,062, Cl. 239-11.000.

Christensen, Thorkild: *See—*
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Chrysler Corporation: *See—*
Crail, Frederick William; and Caron, LaVerne Andrew, 3,978,833.
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Chu, Mosi: *See—*
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Chute, Robert E.: *See—*
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Ciba-Geigy AG: *See—*
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Ciba-Geigy Corporation: *See—*
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Cilia, Phillip F., to Union Carbide Corporation. Multi-ply film articles. 3,979,050, Cl. 229-66.000.
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Cincinnati Milacron Chemicals, Inc.: *See—*
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Okamoto, Shouichi, 3,978,745.
Sekiya, Fukuo; and Morokawa, Shigeru, 3,979,608.
Clampitt, Richard L., to Phillips Petroleum Company. Process for the production of fluids from subterranean formations. 3,978,928, Cl. 166-294.000.
Clancy, David, to Colgate-Palmolive Company. Method and apparatus for the packaging of moist articles. 3,978,636, Cl. 53-21.0FW.
Clark, Burton P.: *See—*
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Clark Equipment Company: *See—*
Burnight, Thomas R.; and Holtkamp, Donald A., 3,978,771.
Chichester, Willard L.; and Holtkamp, Donald A., 3,978,937.
Clark, Gary E.; and Miller, Art J., to Sun Electric Corporation. System for maintaining a diesel engine. 3,978,721, Cl. 73-119.00A.
Clark, Herbert D., to Universal Oil Products Company. Corrosion inhibitor compositions. 3,979,311, Cl. 252-82.000.
Clark, Pauline Carlisle, to Lawrence Peska Associates, Inc., a part interest. Anti-skid attachment for shoes. 3,978,595, Cl. 36-7.700.
Clark, Robert C., to United States of America, Navy. Method for dispersing glass fibers for the preparation of glass filter media. 3,979,253, Cl. 162-145.000.
Clark, Samuel H., to Raymond Lee Organization, Inc., The, a part interest. Rotor tiller with attachment therefor. 3,978,929, Cl. 172-42.000.
Claybaugh, Gene W., to Procter & Gamble Company, The. Hard surface cleaning compositions. 3,979,339, Cl. 252-524.000.
Clemente, A. Harry; and Clemente, Alfredo A., to Jumpan Corporation. Hot pan handling device. 3,979,145, Cl. 294-32.000.
Clemente, Alfredo A.: *See—*
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Martin, David James Reginald, 3,979,674.
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Cobaugh, Robert Franklin; Coller, James Ray; and Taylor, Attalee Snarr, to AMP Incorporated. Apparatus for applying solder rings to terminal posts. 3,978,569, Cl. 29-203.0DS.
Codina, Anthony E. Push-pull type exercising device. 3,979,114, Cl. 272-126.000.
Coffey, Gerald P.: *See—*
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Coffman, Leon M. Masonry block cutter. 3,978,842, Cl. 125-23.00R.
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Cobaugh, Robert Franklin; Coller, James Ray; and Taylor, Attalee Snarr, 3,978,569.
Collins, Dwight D.; and Lauer, Fred W., Jr., to Chemsoil Corporation. Treatment of phosphate rock in soil to provide fertilizer and gypsum. 3,979,199, Cl. 71-40.000.
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Connelly, Tim R.: *See—*
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Consolidation Coal Company: *See—*
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Continental Can Company, Inc.: *See—*
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Cook, Lawrence C., to R. J. Reynolds Tobacco Company. Smoking compositions. 3,978,866, Cl. 131-2.000.
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Cornelius, Gail, to R. M. Wade & Co. Mover unit for irrigation line. 3,978,882, Cl. 137-344.000.
Cornes, Nigel W., to Diplex Limited. Electrical indicators. 3,979,667, Cl. 324-65.00R.
Corning Glass Works: *See—*
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Correia, Yves; and Muller, Francois, to Rhone-Progil. Method of eliminating chloroacetylenes present in hydrogen chloride gas. 3,979,502, Cl. 423-488.000.
Cotton Incorporated: *See—*
Pearce, Larry N.; Neumann, Arthur E.; and Wyssling, Ralph K., 3,978,705.
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Coulter Electronics, Inc.: *See—*
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Courtepatte, Lawrence Alvin; and Currie, Kenneth Wilbur. Apparatus for measuring two dimensions of an object and combining the measured values to obtain single value. 3,978,589, Cl. 33-143.00R.
Couttet, Andre; Dubois, Jean Claude; and Zann, Annie, to Thomson-CSF. Mixture of liquid crystals exhibiting positive dielectric anisotropy and a wide mesomorphic range. 3,979,321, Cl. 252-299.000.
Cowan, Gerald De G.: *See—*
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Cowan, John Gerald: *See—*
Cowan, John Vincent; Cowan, Gerald De G.; and Cowan, John Gerald, 3,978,712.
Cowan, John Vincent; Cowan, Gerald De G.; and Cowan, John Gerald, to Scanning Systems, Inc. Method and apparatus for testing wear, size and residual stress conditions. 3,978,712, Cl. 73-67.50R.
Cowie, George Raymond, to Fisons Limited. Sleeves. 3,979,130, Cl. 277-208.000.
Cowley, William E., to Vermont American Corporation. Drill pack holder. 3,978,984, Cl. 206-379.000.
Cox, Bruce M., to Halliburton Company. Method and apparatus for monitoring and controlling the composition of flammable gas mixtures. 3,978,877, Cl. 137-90.000.
Cragoe, Edward J., Jr.: *See—*
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Crail, Frederick William; and Caron, LaVerne Andrew, to Chrysler Corporation. Engine control circuit for providing a programmed control function. 3,978,833, Cl. 123-117.00R.
Craven, George Frederick, to International Standard Electric Corporation. Waveguide switch. 3,979,703, Cl. 333-98.00S.
Crawford, Wheeler C.: *See—*
Kolaian, Jack H.; Jones, Ronald E.; Crawford, Wheeler C.; and Cummings, William M., 3,979,307.
Crep, John Anthony, to Howmedica, Inc. Bone and joint prosthesis. 3,978,528, Cl. 3-1.910.

Crilly, Thomas W.; and Gariazzo, Michael C., to United States of America, Navy. Function selector. 3,979,580, Cl. 235-150.530.

Cross, Barrington, to American Cyanamid Company. Novel process for the preparation of 3,5-diphenyl-4-pyrazolol and certain derivatives thereof. 3,979,409, Cl. 260-310.00R.

Crossley, Jack; and Wilson, David Henry, to Manesty Machines, Ltd. Hard-gelatin capsule filling machines. 3,978,640, Cl. 53-37.000.

Crowe, Ernest W.: *See—*
Rieger, William H.; and Crowe, Ernest W., 3,979,400.

Crowe, Norman P.: *See—*
Lloyd, Allen H.; Molitor, Edwin A.; Honnert, Quentin E.; Porter, Ronald H.; and Crowe, Norman P., 3,978,973.
Stapp, Willis J.; Crowe, Norman P.; and Molitor, Edwin A., 3,978,785.

Crown, Marlyn Dale; and Finley, Carl Eugene, to Olin Corporation. Regulator valve diaphragm and valve assembly including the same. 3,978,880, Cl. 137-315.000.

Cummings, William M.: *See—*
Kolaian, Jack H.; Jones, Ronald E.; Crawford, Wheeler C.; and Cummings, William M., 3,979,307.

Cundy, Edwin K., to English Clays Lovering Pochin & Company Limited. Flotation of fine-grained materials. 3,979,282, Cl. 209-166.000.

Cuneo, Joseph J.; and Mertl, Ivan, to John J. McMullen Associates, Inc. Double wall cargo tank for transporting cryogenics. 3,978,808, Cl. 114-74.00A.

Currie, Kenneth Wilbur: *See—*
Courtepatte, Lawrence Alvin; and Currie, Kenneth Wilbur, 3,978,589.

Curtiss-Wright Corporation: *See—*
Gavrun, Michael T.; and Loyd, Robert W., Jr., 3,978,826.

Cutler, George Donald, to Dover Corporation. Fluid flow measuring devices. 3,978,728, Cl. 73-212.000.

Cutler, Hymie. Velocity-change control system and method for numerical control machines. 3,979,653, Cl. 318-571.000.

Cutter Laboratories, Inc.: *See—*
Goodenough, John S.; and Parker, Wendell R., 3,978,859.

Daicel Ltd.: *See—*
Sakaguchi, Yasuhiro; Ishii, Kiyoshi; and Kojima, Katumi, 3,979,521.
Uehara, Minoru; Maeda, Kazuo; Fujii, Shoji; and Nishio, Hiromu, 3,978,869.

Daimler-Benz Aktiengesellschaft: *See—*
Bensinger, Wolf-Dieter; Worner, Gunter; and Kurz, Dietrich, 3,978,824.
Fiedler, Horst; Schuller, Walter; and Distel, Manfred, 3,979,010.
Kruse, Werner; and Resch, Reinhard, 3,978,670.

Dalal, Bhadrik Subodhchandra: *See—*
Payne, Michael Ian; and Dalal, Bhadrik Subodhchandra, 3,979,611.

D'Alelio, Gaetano. Polymerizable esters containing oxazolidinone structures. 3,979,406, Cl. 260-307.00C.

D'Alelio, Gaetano F. Preparation of aminophthalic anhydrides. 3,979,416, Cl. 260-346.300.

Dalman, Donald S. Dispensing apparatus for circular hay bales. 3,979,077, Cl. 241-101.700.

Danfoss A/S: *See—*
Jespersen, Aksel, 3,979,710.
Petersen, Jorgen Hartvig, 3,978,883.
Termansen, Poul Erik; and Christensen, Thorkild, 3,978,879.

Dankert, Harry S.: *See—*
Beyer, William F.; and Dankert, Harry S., 3,978,575.

Dansk Andels Aegexport: *See—*
Petersen, Gunnar Christian; Thisgaard, Ole; and Wiig, Steen, 3,978,779.

Darms, Roland: *See—*
Kvita, Vratislav; Darms, Roland; and Greber, Gerd, 3,979,393.

Dart Industries Inc.: *See—*
Heller, Arthur D., 3,979,531.

Darwood, James R., to T.A.D. Avanti, Inc. Telephone answering system with ring detector. 3,979,560, Cl. 179-6.00R.

Data General Corporation: *See—*
Seligman, Lawrence, 3,979,577.

Daugherty, Jon: *See—*
Schneidinger, Carl, 3,978,934.

Dauwalder, Fred R., to Caterpillar Tractor Co. Final drive bearing arrangement. 3,978,935, Cl. 180-9.620.

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de Cremoux, Baudoin, to Thomson-CSF. Component for light detection and emission. 3,979,587, Cl. 250-211.00J.

Deehr, Charles S.: *See—*
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Dehnert, Johannes: *See—*
Gnad, Gerhard; Lamm, Gunther; and Dehnert, Johannes, 3,979,378.

Delagi, Richard G.: *See—*
Lynch, Peter F., Jr.; Delagi, Richard G.; and Haley, Richard E., 3,979,659.

de Lama, Alberto; and Cano, Joseph. Canvas stretcher frame. 3,978,905, Cl. 160-378.000.

Delegation Ministerielle pour l'Armement: *See—*
Tellie, Paul Emile Francois, 3,978,763.

Demajistre, Robert, to PPG Industries, Inc. Radiation-sensitive diacrylates. 3,979,426, Cl. 260-404.500.

Demaria, Anthony J.: *See—*
Reeder, Thomas M.; and Demaria, Anthony J., 3,978,731.

Demi, Roy C.: *See—*
Branson, Charles D.; and Demi, Roy C., 3,979,103.

Denda, Ryuji: *See—*
Nakata, Josuke; and Denda, Ryuji, 3,979,767.

Denin, Adam. Nail driver. 3,979,040, Cl. 227-113.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Fujii, Chiyuki; Yasui, Moroshi; and Ishimathu, Yoshiaki, 3,979,457.

Denticator Company, Inc., The: *See—*
Etherington, Roger F., 3,978,586.

Denzel, Theodor: *See—*
Hoehn, Hans; and Denzel, Theodor, 3,979,399.

De Ruyter, Jackie Andre; and Caveng, Jean-Claude. Synchronization apparatus for speed-changing gearing or transmissions, especially for vehicles. 3,978,951, Cl. 192-53.00C.

Desourdis, Robert I. Thin base self-tracking recording tape. 3,979,541, Cl. 428-181.000.

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Dettling, Joseph R.; and Barry, John P., to United Technologies Corporation. High security lock. 3,979,052, Cl. 232-43.100.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Loffler, Friedrich, 3,979,290.

Deutsche Texaco Aktiengesellschaft: *See—*
Dielacher, Maximilian; and Hansen, Uwe, 3,979,280.
Strehlke, Gunter; and Osterburg, Gunther, 3,979,465.

Devaux, Georges: *See—*
Arnaud, Henri; Hublin, Martial; Devaux, Georges; Lambert, Claude; and Milliot, Henri, 3,978,834.

DeWitt, Stuart. Adjustable hanger strap. 3,979,094, Cl. 248-60.000.

Diamond Crystal Salt Company: *See—*
Mauriello, Francis G., 3,978,637.

Diamond, Julius; and Santora, Norman Julian, to William H. Rorer, Inc. Phenylacetic acids. 3,979,428, Cl. 260-455.00A.

Dictaphone Corporation: *See—*
Matz, Bjorn J., 3,979,661.

Dielacher, Maximilian; and Hansen, Uwe, to Deutsche Texaco Aktiengesellschaft. Separation of unsaturated compounds from liquid hydrocarbon mixtures containing same. 3,979,280, Cl. 208-310.00R.

Diersing, Warren H., to Myers Industries, Inc. Display units with socket-mounted standards. 3,978,631, Cl. 52-239.000.

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Digby, John Robert: *See—*
Forbat, John Egon; Digby, John Robert; and Roper, Timothy Alan, 3,979,740.

Dill, Hans G.: *See—*
Leupp, Alex M.; and Dill, Hans G., 3,978,580.

Dillinger, Robert B.: *See—*
Miller, Ray A.; Dillinger, Robert B.; Stone, W. James; and Burklund, Vernon D., 3,979,089.

Dillman, Thayer L., to Westinghouse Electric Corporation. Sampling system for power generators. 3,978,732, Cl. 73-421.50R.

Dilot, Rolf: *See—*
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DiMattio, Louis Joseph, to RCA Corporation. Electron tube base. 3,979,157, Cl. 339-145.00T.

Diplex Limited: *See—*
Cornes, Nigel W., 3,979,667.

Disparte, Charles P.; Hall, Warren L., Jr.; Isaac, Kenneth N.; and Mock, C. Howard, to Xerox Corporation. Multi-way program branching circuits. 3,979,725, Cl. 340-172.500.

Distel, Manfred: *See—*
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Diszler, Eszter: *See—*
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Dixon, David A.: *See—*
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Doane, William M.: *See—*
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Dobberstein, Riley H.: *See—*
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Doherty, Edward J., III; and Morrison, David W., to Raytheon Company. Large area radiographic scanner. 3,979,592, Cl. 250-363.00S.

Dominion Engineering Works, Limited: *See—*
Bryce, Rodney Harold; Edel, Alfred; and Randpalu, Adu, 3,978,784.

Donahue, Thomas H., to International Telephone and Telegraph Corporation. Frequency modulated saw oscillator. 3,979,697, Cl. 331-107.00A.

Donev, Danail Yovchev: *See—*
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Dover Corporation: *See—*
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Dower, Inc.: *See—*
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Drabek, Jozef: *See—*
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Dragavon, Edward J.: *See—*
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Drake, George L., Jr.: *See—*
Moreau, Jerry P.; Chance, Leon H.; Boudreaux, Gordon J.; and Drake, George L., Jr., 3,979,533.
Drehman, Vera L. Protective pet collar. 3,978,820, Cl. 119-106.000.
Dreikorn, Barry A.; and Thibault, Thomas D., to Eli Lilly and Company. 4,5-Dihydrotetrazolo(1,5-A)quinoxalines. 3,979,387, Cl. 260-250.00Q.
Dresser Industries, Inc.: *See—*
Roesner, Raymond E., 3,978,924.
Drostholm, Frede Hilmar. Apparatus for making continuous lengths of resin tubes. 3,979,250, Cl. 156-425.000.
Drucker, Ernest R. Solar power plant. 3,979,597, Cl. 290-55.000.
Dryla, Ronald, to Lawrence Peska Associates, Inc., a part interest. Programmable water valve. 3,978,887, Cl. 137-624.150.
DSO "Pharmachim: *See—*
Vassilev, Hristo Dimitrov; Zahariev, Simeon Assenov; and Donev, Danail Yovchev, 3,979,269.
DuBell, Thomas L.; Campbell, Thomas C.; and Thompson, James L., to General Electric Company. Cooling ring construction for combustion chambers. 3,978,662, Cl. 60-39.650.
DuBois, Chester G.; and Pollari, Howard M., to Outboard Marine Corporation. Primer system for internal combustion engine. 3,978,839, Cl. 123-187.50R.
Dubois, Jean Claude: *See—*
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Dumstorff, Eugene Francis: *See—*
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Duncan, Anthony B.; and Chin, Arthur H. T., to HydroTech International, Inc. Method and apparatus for plugging a pipeline. 3,978,678, Cl. 61-112.000.
Duncan, Farris N.: *See—*
Bamburg, Robert A.; Duncan, Farris N.; and Floyd, Roger M., 3,979,045.
Duncan, Richard K., to Mead Corporation, The. Form-fitting shipping container. 3,978,982, Cl. 206-326.000.
Dunegan, Ronald G.: *See—*
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Dunlop Limited: *See—*
Newton, Derek Alan, 3,979,110.
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Smart, Thomas John, 3,979,553.
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Govindan, Tirunillayi S., 3,979,535.
Jaffe, Edward Ephraim; Marshall, William Joseph; and Stefancsik, Ernest Anton, 3,979,377.
Klopping, Hein Louis, 3,979,518.
Moffett, Walter K., 3,979,540.
Duranleau, Roger G.; and Taylor, Dennis R., to Texaco Inc. Preparation of dioxyimino-cycloalkanones and related intermediates. 3,979,455, Cl. 260-566.00A.
Durth, Wilfried, to Buderus'sche Eisenwerke Aktiengesellschaft. Food cooking oven with controlled air circulation. 3,978,843, Cl. 126-21.00A.
Dusbiber, Warren M., to Acushnet Company. Ball and process and composition of matter for production thereof. 3,979,126, Cl. 273-218.000.
Dyckerhoff & Widmann Aktiengesellschaft: *See—*
Herbst, Thomas, 3,978,674.
Dyckman, Edward J.; Montemarano, Jean A.; Fischer, Eugene C.; and Ressler, Robert R., to United States of America, Navy. Nonpolluting, antifouling composition and method. 3,979,354, Cl. 260-37.0EP.
Dynamit Nobel Aktiengesellschaft: *See—*
Strunk, Manfred; Kroschel, Heinz; and Voss, Alfred, 3,978,795.
E. F. I. Inc.: *See—*
Harris, George A., 3,978,915.
E. R. Squibb & Sons, Inc.: *See—*
Hoehn, Hans; and Denzel, Theodor, 3,979,399.
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Eastern Company, The: *See—*
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Hagemeyer, Hugh J., Jr.; and Holmes, Jerry D., 3,979,432.
Eaton Corporation: *See—*
Klein, Frank N., 3,979,662.
Eaton, John Richard; and Ashcroft, Derek William. Microprogram unit for a data processor. 3,979,729, Cl. 340-172.500.
Ebara Udylite Kabushiki Kaisha: *See—*
Ishiyama, Koichi; Sakata, Yuji; and Wada, Ikuo, 3,979,220.
Eberius, Wiprecht; Wick, Gerhard; Grotjahn, Heinz; and Jacobs, Eckart, to Akzo N.V. Method of producing polyurethane filaments. 3,979,363, Cl. 260-77.5AT.
Ebling, Wendell V.; Goldsmith, Herbert; and Rodriquez, Rodolfo R., to Baxter Laboratories, Inc. Conductivity monitoring system. 3,979,665, Cl. 324-30.00R.
Echols, Charles W., Sr., to William L. Bonnell Company, The. Thermal barrier curtain wall. 3,978,629, Cl. 52-235.000.
Ecke, Gunter: *See—*
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Edel, Alfred: *See—*
Bryce, Rodney Harold; Edel, Alfred; and Randpalu, Adu, 3,978,784.
Eguchi, Tomoki; Akitsune, Kenji; Unoki, Michio; Katsoka, Jinichi; Kato, Toshiki; and Hiai, Atsuhiko, to Mitsui Toatsu Chemicals, Incorporated. Method of separating liquid drops from a gas stream. 3,979,392, Cl. 260-249.70A.
Egyesult Izzolampa ES Villamossagi RT: *See—*
Mezey, Sandor, 3,978,979.
Electronique Marcel Dassault: *See—*
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Elek, Sandor: *See—*
Toth, Istvan Tibor; Bite, Pal; Magyar, Gyorgy; Diszler, Eszter; Borsy, Jozsef; Maderspach, Andrea; Polgari, Istvan; Elek, Sandor; and Elekes, Istvan, 3,979,405.
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Wild, Gene M., 3,979,383.
Yahner, Joseph A., 3,979,453.
Zinnbauer, Gerald Boyd, 3,978,985.
Elzenbeck, Manfred, to August Froscher K.G. Chair having a vertically adjustable headrest. 3,979,150, Cl. 297-410.000.
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Emi-Varian Limited: *See—*
Green, Michael Curzon, 3,979,626.
Endres, Leland S., to Minnesota Mining and Manufacturing Company. Fluoroaliphatic phenols. 3,979,463, Cl. 260-623.00D.
English Clays Lovering Pochin & Company Limited: *See—*
Cundy, Edwin K., 3,979,282.
English, Robert, to Lawrence Peska Associates, Inc., a part interest. Airplane game apparatus. 3,978,609, Cl. 46-1.00B.
Enomoto, Masao: *See—*
Yamashita, Makoto; Kushida, Masagoro; Niitsuma, Fumio; Enomoto, Masao; and Miyamoto, Akira, 3,979,158.
Enshu, Limited: *See—*
Inagawa, Mitsugu; and Miyazaki, Isamu, 3,978,893.
Epina, August P.; Olmsted, Dennis R.; Platter, Sanford; Jones, Robert J.; and Marion, Jack L., to Storage Technology Corporation. Apparatus for cleaning back surface of magnetic tape. 3,978,546, Cl. 15-306.00A.
Erdman, Robert J.: *See—*
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Ergenc, Mehmet Sahabettin: *See—*
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Erhardt, Peter F., to Xerox Corporation. Method of making a photoreceptor. 3,979,495, Cl. 264-158.000.
Erickson, Clifford W., to Honeywell Inc. High order beam mode resonator. 3,979,695, Cl. 331-94.50C.
Ericson, Alvin E., to Union Carbide Corporation. Method of perforating thermoplastic film. 3,979,494, Cl. 264-154.000.
Ericson, John A. Discharge valve assembly for a metal ladle actuated through bottom of ladle. 3,979,031, Cl. 222-592.000.
Escalette, Henry Ross, to TRE Corporation. Display hardware for lock sets. 3,978,799, Cl. 108-28.000.
Essilor International "Cie Generale D'Optique": *See—*
Bettiol, Bruno, 3,978,741.
Etherington, Roger F., to Denticator Company, Inc., The. Dental apparatus. 3,978,586, Cl. 32-27.000.
Ettenhofer, Kurt L.; Thomas, Richard L.; and Harris, John L., to United States of America, Navy. Sensor array acoustic detection system. 3,979,712, Cl. 340-6.00R.
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Eventoff, Arnold T. Self-closing refrigerator door. 3,978,617, Cl. 49-404.000.
Everhart, Norman. Overvoltage protection arrangement. 3,979,644, Cl. 317-20.000.

Ewing, Lloyd: *See—*
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Faaca Inc.: *See—*
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Fabrique Nationale Herstal S.A.: *See—*
Vandermeirsch, Marcel A., 3,978,689.

Facet Enterprises, Inc.: *See—*
Miller, Donald Leroy, 3,978,953.

Fachbach, Heinz; Thien, Gerhard; and Greier, Josef, to List, Hans. Cooler-cum-blower assembly for internal combustion engines. 3,978,919, Cl. 165-135.000.

Fahey, John L.: *See—*
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Failli, Amedeo; and Gotz, Manfred, to American Home Products Corporation. Derivatives of imidazolidin-2-ones and -2-thiones. 3,979,380, Cl. 260-239.700.

Fairchild Camera and Instrument Corporation: *See—*
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Fairmont Foods Company: *See—*
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Farmer, Douglas A., Jr.: *See—*
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Farmer, Earl T.; Keith, Claude R.; and Keith, Garland B. Apparatus for cutting fibrous tow into staple. 3,978,751, Cl. 83-403.000.

Farstad, Johan T., to IRD Mechanalysis, Inc. Low frequency, high sensitivity electromechanical transducer. 3,978,715, Cl. 73-71.200.

Fathauer, George H.; and Bachman, Wesley J., to A.O. Smith Harvestore, Inc. Weighing system for conveying means. 3,979,055, Cl. 235-92.0WT.

Fatzer, Willy: *See—*
Schmid, Rolf; Lohse, Friedrich; Fatzer, Willy; and Batzer, Hans, 3,979,477.

Faulstich, George W., to Three Sisters Ranch Enterprises. Tearable skirt plastic water bottle cap. 3,979,002, Cl. 215-256.000.

Faxon, Charles E. Electromagnetic motor utilizing attraction and repulsion forces. 3,979,652, Cl. 318-254.000.

Federal-Mogul Corporation: *See—*
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Fehmi, Lester G.; and Schneider, Joseph R., to Biofeedback Computers, Inc. Multiple channel phase integrating biofeedback computing method. 3,978,847, Cl. 128-2.10B.

Feist, Wolfgang M.: *See—*
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Feldgun, Leon Izrailevich: *See—*
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Feldman, Jerome M., to Hi-Tech Industries, Incorporated. Guitar instruction system. 3,978,756, Cl. 84-470.000.

Feneberg, Paul; and Schatz, Anton, to AGFA-Gevaert, A.G. Apparatus for working the marginal zones of a lens. 3,978,620, Cl. 51-105.0LG.

Fenichel, Richard L.: *See—*
Strike, Donald P.; Kao, Wenling; and Fenichel, Richard L., 3,979,446.

Fennekels, Peter; Helfert, Sieghard; and Waltmann, Ernst, to Girmes-Werke AG. Process for printing long piled material. 3,978,789, Cl. 101-211.000.

Fenton, Alvin P., to Kohler Company. Automatic choke assembly for small engines. 3,978,835, Cl. 123-119.00F.

Ferrell, Ralph T.: *See—*
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Ferrell, Wesley: *See—*
Neville, James J.; Ferrell, Wesley; and Shichman, Daniel, 3,979,536.

Ferrozzi, Claudio, to AMF Incorporated. Method and apparatus for forming pack wrappers in cigarette packers. 3,978,639, Cl. 53-32.000.

Fesik, Leonid Nikolaevich; Kovtun, Lev Fedorovich; Lindenbaum, Igor Georgievich; and Konjuchenko, Mikhail Mikhailovich. Suspension insulator. 3,979,554, Cl. 174-177.000.

Fettel, Bruce E.; and Burd, Samuel, to Fettel, Bruce E.; and Burd, Samuel. Expanding tip embolectomy catheter with indicator balloon. 3,978,863, Cl. 128-348.000.

Feuersanger, Alfred E.; and Brecher, Charles, to GTE Laboratories Incorporated. Compound detector for magnetic domain memory devices. 3,979,738, Cl. 340-174.0TF.

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Fick, Paul A., to National Machinery Company, The. Method for making shouldered tubular rivets. 3,978,538, Cl. 10-27.00E.

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Fiedler, Horst; Schuller, Walter; and Distel, Manfred, to Daimler-Benz Aktiengesellschaft. Fuel tank for a motor vehicle. 3,979,010, Cl. 220-86.00R.

Filac Corporation: *See—*
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Filippov, Dmitry Alexandrovich: *See—*
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Filippova, Rufina Alexandrovna: *See—*
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Fink, Herbert; Pennewiss, Horst; Plainer, Hermann; Trabitzsch, Hans; Frieser, Josef; and Masanek, Juergen, to Rohm GmbH. Dispersions of water-soluble polymers and methods for making and using the same. 3,979,349, Cl. 260-29.6RW.

Finley, Carl Eugene: *See—*
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Firestone, Raymond A.; Fahey, John L.; and Christensen, Burton G., to Merck & Co., Inc. C-3 Substituted cephalosporins. 3,979,384, Cl. 260-243.00C.

Firestone Tire & Rubber Company, The: *See—*
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Firnhaber, Bernhard E.; Chute, Robert E.; and Carter, Brian H., to Pullman Incorporated. Process for the production of primary normal monochloroparaffins. 3,979,470, Cl. 260-658.00R.

Fischer, Eugene C.: *See—*
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Fischer, Paul W.; Pye, David S.; and Gallus, Julius P., to Union Oil Company of California. Method for drilling and treating subterranean formations using a low fluid loss agent. 3,979,304, Cl. 252-8.50C.

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Fischman, Martin; and L'Hommedieu, Jesse H., to GTE Sylvania Incorporated. Horizontal deflection system. 3,979,640, Cl. 315-387.000.

Fisher, John L., to Kuhlman Corporation. Coolant displacement material. 3,979,552, Cl. 174-15.00R.

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Fohl, Artur. Winding-up device with automatic lock for safety belt. 3,979,083, Cl. 242-107.40R.

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Forbat, John Egon; Digby, John Robert; and Roper, Timothy Alan, to Inertia Switch Limited. Monitoring system. 3,979,740, Cl. 340-276.000.

Forbes, Sheila M.; and Upton, Arthur W. J., to Westinghouse Canada Limited. Variable load gas turbine. 3,978,658, Cl. 60-39.270.
Ford, Eric Harold, to Lumenition Limited. Combustion detector for internal combustion engines. 3,978,720, Cl. 73-116.000.
Ford, George Alan, to Walker-Neer Manufacturing Co., Inc. Injection sub for dual tube drilling. 3,978,923, Cl. 166-224.00R.
Forte, Anthony D., to Union Special Corporation. Ball bearing looper drive. 3,978,801, Cl. 112-176.000.
Fortner, Bennie, to Rain Bird Sprinkler Mfg. Corporation. Governor for rotary sprinkler. 3,979,066, Cl. 239-252.000.
Fossati, George. Modular chandelier. 3,979,584, Cl. 240-78.00F.
Foster, George William, to Chloride Group Limited. Automatic electric battery charging apparatus. 3,979,658, Cl. 320-23.000.
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Franklin, Robert C. Combination dimmer and timer switch mechanism. 3,979,601, Cl. 307-141.000.
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Frater, James J., to Menasha Corporation. Security cover for a container. 3,979,016, Cl. 220-315.000.
Freed, Meier E.; and Potoski, John R., to American Home Products Corporation. Benzobicycloalkane amines. 3,979,434, Cl. 260-468.00H.
Freeman, Peter A., to United States of America, Navy. Fluidic angle-of-attack sensor. 3,978,724, Cl. 73-180.000.
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Fried, John H., to Syntex Corporation. Production of unsaturated carbocyclic ketones. 3,979,458, Cl. 260-586.00E.
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Froberg, Magnus L., to Owens-Corning Fiberglas Corporation. Method of operating glass melting furnace. 3,979,197, Cl. 65-135.000.
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Frydlender, Charles, to SEBEC Societe d'Exploitation de Brevets d'Emballage Cosmetique S.A. Apparatus for treating lipstick and like substances. 3,978,568, Cl. 29-200.00D.
Frye, George Joseph. Microphone coupler for hearing aid having inverted conical end configuration. 3,979,567, Cl. 179-175.10A.
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Fugleberg, Sigmund Peder; and Rastas, Jussi Kalevi, to Outokumpu Oy. Process for purifying aqueous solutions, of metal ions precipitating as arsenides, antimonides, tellurides, and selenides. 3,979,266, Cl. 204-119.000.
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Furuta, Isao; Yagaki, Kazuhito; and Takao, Masami, to Kobe Steel Ltd. Method for denitrating exhaust gases. 3,979,191, Cl. 55-68.000.
Gagnebin, Gustave, to Hermes Precisa International S.A. Typewriter tabulator. 3,978,967, Cl. 197-177.000.
Gagnon, Forrest W.; and Marsh, Arthur H., to Otis Elevator Company. Communication system for guideway operated vehicles. 3,979,091, Cl. 246-8.000.
Gallacher, Lawrence V., to King Industries, Inc. Catalysis of amino resin cross-linking reactions with high molecular weight sulfonic acids. 3,979,478, Cl. 260-850.000.
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Geiser, Edward M., to UOP Inc. Lubricating oil additive. 3,979,309, Cl. 252-32.500.
Gellekink, Bernard, to Hollandse Signaalapparaten B.V. Pulse radar apparatus. 3,979,748, Cl. 343-7.700.
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George, Richard Alexander, to Pye of Cambridge Ltd. Apparatus and method for atomic spectroscopy. 3,979,162, Cl. 356-85.000.
Gerhold, Clarence G., to Universal Oil Products Company. Continuous liquid extraction process with periodic flow of the denser stream. 3,979,281, Cl. 208-311.000.
Geytenbeek, Johannes Jacobus Franciscus, to U.S. Philips Corporation. Method of manufacturing an electrode provided with connection. 3,979,628, Cl. 313-331.000.
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Goldhaber, Marvin L. Casement covering. 3,978,614, Cl. 49-55.000.
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Gollinger, Wolfgang, to ITT Industries, Inc. Crystal oscillator circuit. 3,979,698, Cl. 331-116.00R.
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Shraiber, David Solomonovich; Golodaev, Boris Glebovich; Palkin, Boris Alexandrovich; Zakharov, Leonid Mikhailovich; Genkin, Mikhail Abramovich; Filippov, Dmitry Alexandrovich; and Razumovsky, Anatoly Fedorovich, 3,978,714.
Golomovzjuk, Ivan Korneevich: *See—*
Kuchuk-Yatsenko, Sergei Ivanovich; Solodovnikov, Sergei Alexandrovich; Sakharnov, Vasily Alexeevich; Golomovzjuk, Ivan Korneevich; Kulesh, Alexandr Ivanovich; and Porkhun, Fedor Konstantinovich, 3,978,746.
Golosman, Evgeny Zinovievich; Sobolevsky, Viktor Stanislavovich; Lytkin, Viktor Petrovich; Axenov, Nikolai Nikitovich; Golovkova, Alexandra Ivanovna; Peker, Yakov Anatolievich; Zinchenko, Dmitry Ivanovich; and Ruzinsky, Sergei Ivanovich. Catalyst for dissociation of ammonia and method of preparing same. 3,979,336, Cl. 252-455.00R.
Golovko, Georgy Anatolievich; Lipkind, Boris Alexandrovich; Slepneva, Albina Timofeevna; Leontiev, Alexandr Semenovich; Mazin, Vladimir Mikhailovich; Berezovskaya, Elena Nikolaevna; Burylov, Valentin Alexandrovich; Zubkov, Alexandr Mikhailovich; Konakova, Olga Alexeevna; Judaev, Alexandr Ivanovich; Pavlychev, Valentin Nikolaevich; Ignatov, Jury Yakovlevich; and Kharitonov, Evgeny Alexandrovich. Process for the preparation of synthetic zeolites. 3,979,335, Cl. 252-455.00Z.
Golovkova, Alexandra Ivanovna: *See—*
Golosman, Evgeny Zinovievich; Sobolevsky, Viktor Stanislavovich; Lytkin, Viktor Petrovich; Axenov, Nikolai Nikitovich; Golovkova, Alexandra Ivanovna; Peker, Yakov Anatolievich; Zinchenko, Dmitry Ivanovich; and Ruzinsky, Sergei Ivanovich, 3,979,336.

Gonda, Michihiro: *See—*
Ozutsumi, Minoru; Ohnishi, Yoshitake; Miyazawa, Yoshihide; and Gonda, Michihiro, 3,979,320.

Gondo, Hisashi; Nakayama, Masatoki; Nakasugi, Hajime; and Yamaguchi, Masanobu, to Nippon Steel Corporation. Method for producing large diameter steel pipes. 3,979,231, Cl. 148-12.00R.

Gonzalez, Cesar, to Cessna Aircraft Company, The. Duplex engine oil separator. 3,978,671, Cl. 60-598.000.

Goodenough, John S.; and Parker, Wendell R., to Cutter Laboratories, Inc. Closure member for pierceable access ports. 3,978,859, Cl. 128-272.000.

Goodson, Sam M. Apparatus for spreading and guiding a tubular fabric. 3,978,557, Cl. 26-84.000.

Goodyear Tire & Rubber Company, The: *See—*
Parks, Carl R., 3,979,436.

Gordon, Robert, to International Telephone and Telegraph Corporation. Power regulator circuit. 3,979,610, Cl. 307-297.000.

Gosney, William Milton, to Texas Instruments Incorporated. Regenerative charge detector for charged coupled devices. 3,979,603, Cl. 307-221.00D.

Gotz, Manfred: *See—*
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Gouner, Aubrey L.: *See—*
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Pulitzer, Sidney C.; and Gouner, Aubrey L., 3,978,594.

Govindan, Tirunillayi S., to Du Pont de Nemours, E. I., and Company. Process for the spray application of aqueous paints by controlling the temperature of the air in the paint spray zone. 3,979,535, Cl. 427-422.000.

Graham, Billy J., to National Pride Equipment, Inc. Coin collection system. 3,979,054, Cl. 232-43.200.

Graham, Thomas; Foley, Michael James Yates; and Reid, David, to Reed International Limited. Surface coating compositions containing pigment coated with a polymeric organic polyol. 3,979,343, Cl. 260-16.000.

Grahn, Rolf V.: *See—*
Backstrom, Kaj; Grahn, Rolf V.; Hedenmark, Per O. T. V.; and Ohrstedt, Kjell G., 3,978,798.

Granco Equipment, Inc.: *See—*
Phillips, William A., 3,978,913.
Phillips, William A., 3,978,914.

Granger, Alain; and Sausse, Andre, to Rhone-Poulenc S.A. Artificial haemodialysis kidneys. 3,979,284, Cl. 210-22.00A.

Graves, Delbert B.: *See—*
Riebock, William D.; and Graves, Delbert B., 3,978,904.

Greber, Gerd: *See—*
Kvita, Vratislav; Darms, Roland; and Greber, Gerd, 3,979,393.

Green, Michael Curzon, to Emi-Varian Limited. Electrostatic focusing arrangements. 3,979,626, Cl. 313-240.000.

Greenhalgh, Milton Sharples; and Lever, Ray Clarence, to General Electric Company. Process of continuously blending, molding and curing heat curable polymeric compounds. 3,979,488, Cl. 264-40.700.

Greenman, James R.; and Pelky, Philip J. Folding support bracket. 3,978,943, Cl. 182-155.000.

Gregoire, Jean-Claude. Door frame for an overlapping door. 3,978,619, Cl. 49-504.000.

Gregory, Lester, Jr., to International Acceptor Corporation of Florida. Solid state, coin activated mechanism. 3,978,962, Cl. 194-97.00A.

Greier, Josef: *See—*
Fachbach, Heinz; Thien, Gerhard; and Greier, Josef, 3,978,919.

Griverus, Tor Lennart Bernt. Method and device for correcting the output signal from a digital transducer for measuring a physical magnitude or variable. 3,978,727, Cl. 73-194.00E.

Groce, John C., to International Telephone and Telegraph Corporation. Video processor. 3,979,700, Cl. 333-30.00R.

Groening, Franklin E.: *See—*
Sheppard, Robert S.; and Groening, Franklin E., 3,979,500.

Groff, Eugene R., to Caterpillar Tractor Co. Track wheel for crawler type vehicles. 3,979,154, Cl. 305-21.000.

Gross, Erwin, to Standardwerk Eugen Reis GmbH. Coin counting apparatus. 3,978,873, Cl. 133-8.00A.

Gross, Henry. Decorative auxiliary transparent table top unit for tables, desks, and the like. 3,979,156, Cl. 312-196.000.

Grotjahn, Heinz: *See—*
Eberius, Wiprecht; Wick, Gerhard; Grotjahn, Heinz; and Jacobs, Eckart, 3,979,363.

Grove, Leslie H. Internal gear set having roller teeth. 3,979,167, Cl. 418-61.00B.

Grove, Marvin H.; and Dunegan, Ronald G., to M & J Valve Company. Flow control apparatus and system. 3,978,707, Cl. 73-3.000.

Gruber, Gilbert A.: *See—*
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Gruber, Wolfgang: *See—*
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Grubmuller, Georg: *See—*
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Grueneberg, Dieter: *See—*
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Gruppo Lepetit S.p.A.: *See—*
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Gruss, Mark L.: *See—*
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GTE Laboratories Incorporated: *See—*
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GTE Sylvania Incorporated: *See—*
Davis, Charles A.; and Smithgall, Harry E., 3,979,633.
Fischman, Martin; and L'Hommedieu, Jesse H., 3,979,640.
Fritsch, Carl W., Jr.; and Buljan, Serpej-Tomislav, 3,979,216.
Gunning, Everett A.; and Rehkopf, Charles H., 3,979,632.
Leadvaro, Stephen J.; Gates, Paul E.; and Kimball, Stephen F., 3,979,627.

Guardian Chemical Corporation: *See—*
Globus, Alfred R., 3,979,302.

Guicheteau, Eugene H.; and Johnson, Justin O., Jr., to Honeywell Inc. Process control system using a two wire remote control system. 3,979,654, Cl. 318-599.000.

Guidry, Shelby L.: *See—*
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Gunning, Everett A.; and Rehkopf, Charles H., to GTE Sylvania Incorporated. Cathode ray tube having surface charge inhibiting means therein. 3,979,632, Cl. 313-479.000.

Gunther, John E., to Texas Instruments Incorporated. Charged particle beam scanning device. 3,979,636, Cl. 315-12.00R.

Gussefeld, Horst, to Siemens Aktiengesellschaft. Method for recording stationary flow patterns at boundary surfaces. 3,978,734, Cl. 73-432.00R.

Gustafsson, Gunnar. Dry mop element. 3,978,541, Cl. 15-229.00A.

Gutman, Abraham: *See—*
Labie, Allan S.; Lew, Irwin Paul; Gutman, Abraham; and Thornton, Charles, 3,978,630.

Gutschik, Ernst: *See—*
Kolbe, Joachim; Schneider, Otto; Gutschik, Ernst; and Brokmeier, Dieter, 3,979,544.

Gwyn, John E.: *See—*
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Gyogyszer- es Vegyeszeti Termekek Gyara RT.: *See—*
Toth, Istvan Tibor; Bite, Pal; Magyar, Gyorgy; Diszler, Eszter; Borsy, Jozsef; Maderspach, Andrea; Polgari, Istvan; Elek, Sandor; and Elekes, Istvan, 3,979,405.

Gysin, Hanspeter: *See—*
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H. Vissers B.V.: *See—*
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Haase, Jaroslav: *See—*
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Hackman, Emory E., to United States of America, Navy. Focused blast-fragment warhead. 3,978,796, Cl. 102-67.000.

Hadden, Stephen Clow; Hulls, Leonard Robin; Slaney, Patrick John; and Sutphin, Eldon Marvin, Jr., to RCA Corporation. Tachometer without physical connection to internal combustion engine. 3,978,719, Cl. 73-115.000.

Hadtke, Frederick Borden, to Robert Hain Associates, Inc. Speedometer particularly for water skis. 3,978,725, Cl. 73-182.000.

Hagemeyer, Hugh J., Jr.; and Holmes, Jerry D., to Eastman Kodak Company. Preparation of nitriles. 3,979,432, Cl. 260-465.200.

Hager, Robert J.; Schmit, Joseph L.; Scott, M. Walter; and Stelzer, Ernest L., to Honeywell Inc. Mercury cadmium telluride annealing procedure. 3,979,232, Cl. 148-20.300.

Hague, Duane O., Jr.: *See—*
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Haid, Erich: *See—*
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Haley, Richard E.: *See—*
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Hall, Fred V.: *See—*
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Hall, Jeffrey, to Holset Engineering Company Limited. Fluid coupling. 3,978,952, Cl. 192-58.00B.

Hall, Warren L., Jr.: *See—*
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Halliburton Company: *See—*
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Hamlett, Sidney J., to White Sewing Machine Company. Sewing machine thread tensioner. 3,978,802, Cl. 112-254.000.

Hamm, Philip C.: *See—*
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Hammann, Ingeborg: *See—*
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Stolzer, Claus; Hammann, Ingeborg; and Unterstenhofer, Gunter, 3,979,512.

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Han, Njo Hong: *See—*
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Handrick, Kurt; Benning, Anton; George, Dietrich; and Schlegel, Jurgen, to Bergwerksverband GmbH. Processes for the continuous production of aromatic carboxylic acids by oxidation with nitric acid of aromatic compounds containing oxidizable acyclic substituents. 3,979,448, Cl. 260-524.00N.

Hansen, Charles E.: *See—*
Pickens, George O.; and Hansen, Charles E., 3,978,813.

Hansen, Uwe: *See—*
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Hara, Fumio: *See—*
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Harada, Kunihara: *See—*
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Harato, Kazunori; Sakata, Yoshihiro; and Nishimura, Yutaka, to Hitachi Metals, Ltd. Tilting centrifugal casting machine. 3,978,911, Cl. 164-286.000.

Hargitai nee Franyo, Aniko: *See—*
Johan, Bela; Szemler, Laszlo; Szontagh, Tamas; Kuti, Laszlo; Simonovits, Emilia; Bekes nee Erdos, Judit; Szekely, Denes; Kiss, Janos; Kovacs nee Komoroczy, Erzsebet; and Hargitai nee Franyo, Aniko, 3,979,259.

Harries, David Anthony: *See—*
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Harrington, William W.; and Alpers, Frederick C., to United States of America, Navy. Radiometric target detection device. 3,978,797, Cl. 102-70.20P.

Harris Corporation: *See—*
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Harris, George A., to E. F. I. Inc. Condenser with leak detecting apparatus. 3,978,915, Cl. 165-11.000.

Harris-Intertype Corporation: *See—*
Kolb, Edwin R.; and Horvath, Robert M., 3,979,742.

Harris, John. Educational board game. 3,979,121, Cl. 273-134.0AD.

Harris, John L.: *See—*
Ettenhofer, Kurt L.; Thomas, Richard L.; and Harris, John L., 3,979,712.

Harris, Mark, to Brunswick Corporation. Capacitor discharge ignition testing apparatus employing visual spark gap indicator. 3,979,664, Cl. 324-17.000.

Harrison, Ian T.: *See—*
Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., 3,979,414.

Harsanyi, Kalman; Takacs, Kalman; Kiss, Pal; Szekeres, Laszlo; Papp, Gyula; and Benedek, Eva, to Chinoin Pharmaceutical and Chemical Works Ltd. Pharmaceutically effective novel 3,4-dihydro-1,2- and 1,3-thiozolo [4,3a] isoquinolines and a process for preparing same. 3,979,397, Cl. 260-288.0CF.

Harshbarger, John H., to Visual Information Institute, Inc. Power loss alarm system. 3,979,741, Cl. 340-248.00B.

Hartley, Ezra Dale. Dispenser for flowable material. 3,979,023, Cl. 222-61.000.

Harvey, Walter W.; Randlett, Myron R.; and Bangerskis, Karlis I., to Kennecott Copper Corporation. Apparatus for series electrowinning and electrorefining of metal. 3,979,275, Cl. 204-198.000.

Hashimoto, Yukio; and Morokawa, Shigeru, to Citizen Watch Co., Ltd. Electric timepiece. 3,978,650, Cl. 58-23.0AC.

Hauni-Werke Korber & Co., KG: *See—*
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Hauser, Oscar G.; and Schmidlin, Fred W., to Xerox Corporation. Patterned gravure and doctoring means therefor. 3,978,817, Cl. 118-637.000.

Hawley Manufacturing Corporation: *See—*
Overmyer, Robert C.; and Nijhawan, Pramodh, 3,979,551.

Hay, Allan S., to General Electric Company. Process for the preparation of an organomercaptophenol from sulfur, a 2,6-disubstituted phenol, and an activated olefin or an epoxy compound. 3,979,460, Cl. 260-609.00F.

Hayden, Rodney, to TRW Inc. Automotive relay of the hold-in type. 3,979,705, Cl. 335-151.000.

Hayes, John C., to Universal Oil Products Company. Hydroprocessing of hydrocarbons. 3,979,277, Cl. 208-143.000.

Hayes, John C., to Universal Oil Products Company. Hydroprocessing of hydrocarbons. 3,979,278, Cl. 208-143.000.

Hayward, Alan Thomas Joseph, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the. Members moving within tubes. 3,978,708, Cl. 73-3.000.

Hayward, Martin Henry; and Newton, Michael Charles, to Automatic Revenue Controls (Europa) Ltd. Turnstile mechanism. 3,978,613, Cl. 49-46.000.

Hazemag Dr. E. Andreas KG: *See—*
Boddeker, Hans-Joachim; and Konig, Rolf, 3,979,078.

Healey, Daniel P., Jr., to Chase-Shawmut Company, The. Electric fuse having a multiply casing of a synthetic - resin glass-cloth laminate. 3,979,709, Cl. 337-186.000.

Hedenmark, Per O. T. V.: *See—*
Backstrom, Kaj; Grahn, Rolf V.; Hedenmark, Per O. T. V.; and Ohrstedt, Kjell G., 3,978,798.

Hedman, Jonathan W., to General Electric Company. Series feed membrane stack. 3,979,190, Cl. 55-158.000.

Heidt, Henry M., to Babcock & Wilcox Company, The. Method for reducing uranium tetrafluoride. 3,979,499, Cl. 423-253.000.

Heimbach, Heinrich: *See—*
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Heinemann, Helmut: *See—*
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Heitmann, Hans-Gunter; and Schott, Manfred, to Kraftwerk Union Aktiengesellschaft. Double-flow magnetic filter, apparatus and method. 3,979,288, Cl. 210-42.00S.

Heldenbrand, Ladd L. Litter packages. 3,978,818, Cl. 119-1.000.

Helfert, Sieghard: *See—*
Fennekels, Peter; Helfert, Sieghard; and Waltmann, Ernst, 3,978,789.

Helinski, Edward F.; and Zable, Jack L., to International Business Machines Corporation. Method and apparatus for merging satellites in an ink jet printing system. 3,979,756, Cl. 346-1.000.

Heller, Arthur D., to Dart Industries Inc. Fluidized bed top surface stabilization mechanism. 3,979,531, Cl. 427-185.000.

Hendry, Donald H.; Ivester, Andrew S.; and Johnson, Bruce K., to Polaroid Corporation. Modular photographic system. 3,979,762, Cl. 354-288.000.

Henkel & Cie G.m.b.H.: *See—*
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Henry, Wayne E.: *See—*
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Hepworth, Edward C.; and Means, Rodney J., to Motorola, Inc. Asynchronous status interlock circuit for interface adaptor. 3,979,732, Cl. 340-172.500.

Herber, John F., to Monsanto Company. Dye solvents for pressure-sensitive copying systems. 3,979,324, Cl. 252-364.000.

Herber, John F., to Monsanto Company. Dye solvents for pressure-sensitive copying systems. 3,979,327, Cl. 252-364.000.

Herbert, Roger B.; Horowitz, Harvey A.; and Barrett, Donald F., to Westinghouse Electric Corporation. Analog automatic slowdown system. 3,979,080, Cl. 242-78.600.

Herbes, Edwin James; and Riggs, Ray Vere, to Boeing Company, The. Cargo power drive unit. 3,978,975, Cl. 198-782.000.

Herbst, Thomas, to Dyckerhoff & Widmann Aktiengesellschaft. Device for the discharge of compression material in the production of the compression member of a pull and pressure anchor. 3,978,674, Cl. 61-39.000.

Herchin, Michel A.; and Blandin, Jacques H., to Societe Nationale des Poudres et Explosifs. Process for controlling the ballistic characteristics of double-base propellants. 3,979,486, Cl. 264-3.00B.

Herchner, Dieter, to Licentia Patent-Verwaltungs-G.m.b.H. Constant current source. 3,979,663, Cl. 323-4.000.

Hermes Precisa International S.A.: *See—*
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Heron, Pierre D., to Centre Technique du Bois. Machines for cutting wood and other ligneous materials into small pieces. 3,979,075, Cl. 241-93.000.

Herter, Martin. Apparatus for conveying particulate materials. 3,978,978, Cl. 198-601.000.

Hesse, Wolfgang; Lorentz, Guido; and Rauhut, Klaus, to Hoechst Aktiengesellschaft. Process for preparing cement. 3,979,218, Cl. 106-90.000.

Hesston Corporation: *See—*
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Heyden, Werner: *See—*
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Hibino, Masahiro: *See—*
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Hickman, Ronald P.; Luff, Brian Anthony; Rossell, Edgar Ronald; and Bernard, Derek John Charles, to Inventec International Limited. Ladder. 3,978,944, Cl. 182-162.000.

Higbee, David E., to Phillips Petroleum Company. Article having a poly(arylene sulfide) coating and method of producing. 3,979,543, Cl. 428-331.000.

Higgins, Bobby L.: *See—*
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Hilko, John: *See—*
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Hill, Rodney E.: *See—*
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Hillman, Jon G. Saddle. 3,978,644, Cl. 54-44.000.

Hillman, Thomas F.; and Pienkoski, Arthur H., to Corning Glass Works. Article trimming apparatus. 3,979,174, Cl. 425-292.000.

Hills, William H.: *See—*
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Hinkle, Francis E.; and Rohde, David F., to United States of America, Navy. Level-code encoded multiplexer. 3,979,561, Cl. 179-15.00A.

Hirayama, Chikara: *See—*
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Hirose, Kazumasa: *See—*
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Hirose, Tadatsugu: *See—*
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Hirsbrunner, Pierre; and Bertholet, Raymond, to Societe d'Assistance Technique pour Produits Nestle S.A. Preparation of an asparagine or a glutamine. 3,979,449, Cl. 260-534.00E.
Hitachi, Ltd.: *See—*
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Arakawa, Yoshihiro; Nakashima, Akio; Iwabuchi, Shunji; and Ando, Kenji, 3,979,641.
Ikeda, Tsuneo, 3,979,683.
Iwase, Hiroo; and Ninomiya, Satoshi, 3,979,014.
Nagatomo, Katuaki; Fukumori, Hiromasa; and Narikiyo, Hiroyuki, 3,978,918.
Tadauchi, Masaharu, 3,979,760.
Takei, Ichiro; Sasaki, Katsuyoshi; and Nishida, Sumio, 3,979,768.
Tanaka, Goro; Toyoda, Shinichi; and Narahara, Toshikazu, 3,979,365.
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Hitomi, Nobuteru: *See—*
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Hoag, Kip J., to McGraw-Edison Company. Portable humidifier. 3,979,485, Cl. 261-30.000.
Hobart Corporation: *See—*
Burns, Richard H.; and Walthour, William J., 3,979,573.
Hobbensiefken, Dean; and Signa, Michael A. Transmission shift control. 3,978,739, Cl. 74-473.00R.
Hobbs, Stanley Y.; and Pratt, Charles F., to General Electric Company. Control of foam generation in gas-liquid separation towers. 3,979,192, Cl. 55-87.000.
Hochtemperatur-Kernkraftwerke GmbH (HKG) Gemeinsames Europaisches Unternehmen: *See—*
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Hodgson, R. W.; and Rands, Steve A. Multi-directional aerosol valve for use on an aerosol container. 3,979,029, Cl. 222-402.170.
Hodogaya Chemical Co., Ltd.: *See—*
Ozutsumi, Minoru; Ohnishi, Yoshitake; Miyazawa, Yoshihide; and Gonda, Michihiro, 3,979,320.
Hoebrechts, Albert G.: *See—*
van den Berg, Johan H.; van Eekelen, Alex H.; and Hoebrechts, Albert G., 3,978,544.
Hoebrechts, Albert J. G.: *See—*
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Hoechst Aktiengesellschaft: *See—*
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Hesse, Wolfgang; Lorentz, Guido; and Rauhut, Klaus, 3,979,218.
Polenz, Walther, 3,978,749.
Schmidt, Hartmut; Neumann, Jurgen; and Arneth, Reinhold, 3,978,986.
Hoehn, Hans; and Denzel, Theodor, to E. R. Squibb & Sons, Inc. Amino derivatives of pyrazolopyridine carboxamides. 3,979,399, Cl. 260-295.50B.
Hoehn, Marvin M.: *See—*
Marconi, Gary G.; and Hoehn, Marvin M., 3,979,433.
Hoerner Waldorf Corporation: *See—*
Bliss, Robert A., 3,979,019.
Roccaforte, Harry L., 3,978,980.
Hoffmann, Gunter; Kopke, Wilfried; and Weissner, Rudiger, to Volkswagenwerk Aktiengesellschaft. Safety device having a contoured energy absorbing impact element. 3,979,139, Cl. 280-751.000.
Hoffmann, Herbert; Neubert, Rolf; and Wachendorf, Friedrich, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Control of break-up roller speed in open-end spinning unit. 3,978,646, Cl. 57-58.950.
Hoffmann-La Roche Inc.: *See—*
Confalone, Pasquale Nicholas; Uskokovic, Milan Radoje; and Pizzolato, Giacomo, 3,979,396.
Fryer, Rodney Ian; and Garcia, Edward Ernest, 3,979,410.
Hunziker, Paul, 3,979,262.
Hoffmeister, Bernhard, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Hollow guiding mast for a charging device of a core reactor. 3,978,957, Cl. 193-1.000.
Hofmann, Neil R.: *See—*
Zumalt, Michael D.; Hofmann, Neil R.; and Bassett, Melvin C., 3,979,182.
Hoke, Donald Irvin, to Lubrizol Corporation, The. Oil-soluble polymers of N-3-aminoalkyl acrylamides, and lubricants containing them. 3,979,441, Cl. 260-482.00R.
Holcomb, Burton V. Impression trays. 3,978,585, Cl. 32-17.000.
Holland, Alvina: *See—*
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Holland, Joseph P.: *See—*
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Holland, Leo; Holland, Joseph P.; and Holland, Alvina, to Lawrence Peska Associates, Inc., a part interest. Wallpaper dispenser and method of operation. 3,979,242, Cl. 156-71.000.
Hollandse Signaalapparaten B.V.: *See—*
Burgers, Bernhardus Walter Antonius; and Teulings, Wilhelmus Antonius, 3,979,678.
Gellekink, Bernard, 3,979,748.
Holmes, Jerry D.: *See—*
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Holset Engineering Company Limited: *See—*
Hall, Jeffrey, 3,978,952.
Holtkamp, Donald A.: *See—*
Burnight, Thomas R.; and Holtkamp, Donald A., 3,978,771.
Chichester, Willard L.; and Holtkamp, Donald A., 3,978,937.
Honda, Mamoru: *See—*
Toyoshima, Shigeru; Honda, Mamoru; Nakamura, Katsuya; and Seki, Katsuhisa, 3,979,648.
Honea, Thomas H. Mobile log skidder. 3,978,990, Cl. 212-9.000.
Honeywell Inc.: *See—*
Adams, James R., Jr., 3,979,639.
Erickson, Clifford W., 3,979,695.
Guicheteau, Eugene H.; and Johnson, Justin O., Jr., 3,979,654.
Hager, Robert J.; Schmit, Joseph L.; Scott, M. Walter; and Stelzer, Ernest L., 3,979,232.
Honeywell Information Systems, Inc.: *See—*
Lange, Ronald Edwin; Dobberstein, Riley H.; and Webber, Steven Hugh, 3,979,726.
Honig, Edith M., to Lawrence Peska Associates, Inc., a part interest. Napkin. 3,978,553, Cl. 24-7.000.
Honma, Yoshio; and Takahashi, Junichi, to Tokyo Shibaura Electric Co., Ltd.; and Toshiba Engineering Co., Ltd. Descaling system for the cooling water tubes of a steam condenser. 3,978,917, Cl. 165-95.000.
Honnert, Quentin E.: *See—*
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Hooftman, Johannes Phillippus: *See—*
Oosterling, Pieter Adriaan; and Hooftman, Johannes Phillippus, 3,979,072.
Hooker Chemicals & Plastics Corporation: *See—*
Bajer, Francis J., 3,979,418.
Hoppe, William C., to Vendo Company, The. Ingredient temperature stabilization apparatus for post-mix beverage dispensing machines. 3,979,024, Cl. 222-67.000.
Horak, Josef: *See—*
Muck, Eduard; Horak, Josef; Strachota, Jaroslav, deceased; Bolesiav, Jiri; Grygera, Lubomir; Bogdanovicz, Ladislav; and Hvezda, Otto, 3,979,532.
Horikawa, Toshio: *See—*
Kosaka, Kenzo; Horikawa, Toshio; Uchida, Minoru; Morioka, Shin; Shibata, Kunio; and Takahashi, Eizi, 3,978,647.
Horst, Larry P.: *See—*
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Horowitz, Harvey A.: *See—*
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Horvath, Robert M.: *See—*
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Houbolt, Neal, to Jemco Engineering Co. Burner identification device for kitchen ranges. 3,978,845, Cl. 126-39.00R.
Houilleres du Bassin du Nord et du Pasde-Calais: *See—*
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House, Ralph, to Chevron Research Company. Process for preparing nitroaromatic nitriles. 3,979,431, Cl. 260-465.00R.
Houston, Douglas E.; Krishna, Surinder; and Baliga, Bantval Jayant, to General Electric Company. Gate modulated bipolar transistor. 3,979,769, Cl. 357-57.000.
Howard, James A., to Byron Jackson, Inc. Vertically adjustable pipe racking apparatus. 3,978,993, Cl. 214-2.500.
Howe, Ronald D. Collapsible watercraft. 3,978,536, Cl. 9-2.00C.
Howmedica, Inc.: *See—*
Crep, John Anthony, 3,978,528.
Hoyt Corporation, The: *See—*
Hoyt, Edwin R., 3,979,252.
Hoyt, Edwin R., to Hoyt Corporation, The. Apparatus for manufacturing cellular structures. 3,979,252, Cl. 156-512.000.
Hublin, Martial: *See—*
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Hudson Lock, Inc.: *See—*
Patriquin, George P., 3,978,764.
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Hughes Aircraft Company: *See—*
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Buchman, William W., 3,979,696.
Burke, Roger A.; and Somogyi, Bela, 3,978,653.
Leupp, Alex M.; and Dill, Hans G., 3,978,580.
O'Meara, Thomas R., 3,979,585.
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Schwider, Alfred W.; Burnham, John; and Buritz, Robert S., 3,979,530.
Hughes, David Robert; and Polischuk-Sawtschenko, Alexander, to International Business Machines Corporation. Digital data communication network and control system therefor. 3,979,723, Cl. 340-147.00R.

Hughes, John D.; and Klingensmith, Al W., to White-Westinghouse Corporation. Vapor saving ambient air intake system for a dry cleaner. 3,978,694, Cl. 68-18.00R.

Hull Corporation: *See—*
Jennings, Thomas A., 3,979,706.

Hulls, Leonard Robin: *See—*
Hadden, Stephen Clow; Hulls, Leonard Robin; Slaney, Patrick John; and Sutphin, Eldon Marvin, Jr., 3,978,719.

Hung, Paul P.; Shipkowitz, Nathan L.; and Von Esch, Anne Mary, to Abbott Laboratories. Inhibitors of reverse transcriptase enzymes. 3,979,511, Cl. 424-181.000.

Hunsinger, Bill J.; and Peppler, Jerry H., to Magnavox Company, The. Apparatus and method for oversampled transducers in acoustic surface wave devices. 3,979,702, Cl. 333-72.000.

Hunziker, Paul, to Hoffmann-La Roche Inc. Compositions and methods for the determination of oxidizing agents. 3,979,262, Cl. 195-103.50R.

Huot, Tommy J. Tire carrier for stock racks. 3,979,035, Cl. 224-42.240.

Hurzeler, Rene; and Lincke, Paul, to Sulzer Brothers Limited. Apparatus for dyeing a travelling strip such as yarn. 3,978,695, Cl. 68-20.000.

Huston, Robert B., to Lawrence Peska Associates, Inc., a part interest. Nail polish bottle opener and nail care implement. 3,978,871, Cl. 132-73.000.

Hutchinson, Kenneth A.: *See—*
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Hvezda, Otto: *See—*
Muck, Eduard; Horak, Josef; Strachota, Jaroslav, deceased; Boleslav, Jiri; Grygera, Lubomir; Bogdanovicz, Ladislav; and Hvezda, Otto, 3,979,532.

Hycom Incorporated: *See—*
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Hydranautics: *See—*
Chambers, Henry B.; Tellefson, Clair W.; and Balsillie, Tony H., 3,978,676.

Hydroacoustics Inc.: *See—*
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HydroTech International, Inc.: *See—*
Duncan, Anthony B.; and Chin, Arthur H. T., 3,978,678.

Hyodo, Masayoshi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Switching apparatus. 3,979,570, Cl. 200-264.000.

Ibrahim, Jutta: *See—*
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Ichikoh Industries Limited: *See—*
Yamashita, Makoto; Kushida, Masagoro; Niitsuma, Fumio; Enomoto, Masao; and Miyamoto, Akira, 3,979,158.

Idemitsu Petrochemical Co., Ltd.: *See—*
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Ido, Kazuo: *See—*
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Iedema, Harry William Jelle: *See—*
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Igelhaut, Hans, to Triumph Werke Nurnberg A.G. Pilgrim step indexing mechanism. 3,978,736, Cl. 74-112.000.

Ignatov, Jury Yakovlevich: *See—*
Golovko, Georgy Anatolievich; Lipkind, Boris Alexandrovich; Slepneva, Albina Timofeevna; Leontiev, Alexandr Semenovich; Mazin, Vladimir Mikhailovich; Berezovskaya, Elena Nikolaevna; Burylov, Valentin Alexandrovich; Zubkov, Alexandr Mikhailovich; Konakova, Olga Alexeevna; Judaev, Alexandr Ivanovich; Pavlychev, Valentin Nikolaevich; Ignatov, Jury Yakovlevich; and Kharitonov, Evgeny Alexandrovich, 3,979,335.

Ignaz Vogel GmbH und Co. KG: *See—*
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Ikeda, Koichi; and Ikeda, Hideo, to Nissan Motor Co., Ltd. Heat-insulated exhaust pipe. 3,979,246, Cl. 156-187.000.

Ikeda, Tsuneo, to Hitachi, Ltd. Noise eliminator circuit. 3,979,683, Cl. 328-165.000.

Ilon, Bengt Erland. Lifting device. 3,978,531, Cl. 5-81.00R.

Images De Luxe, Inc.: *See—*
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Imperial Chemical Industries Limited: *See—*
Galt, Ronald Hilson Begg; and Glen, Alasdair Thomas, 3,979,513.
Punja, Nazim, 3,979,519.
Rose, John Brewster, 3,979,459.

in 't Veld, Cornelis, to National Marine Service, Inc. Oil boom and method of skimming floating oil from the surface of a body of water. 3,979,291, Cl. 210-84.000.

Inaba, Shigeho: *See—*
Sasajima, Kikuo; Ono, Keiichi; Nakao, Masaru; Maruyama, Isamu; Takayama, Masaharu; Katayama, Shigenari; Katsube, Junki; Inaba, Shigeho; and Yamamoto, Hisao, 3,979,390.

Inagawa, Mitsugu; and Miyazaki, Isamu, to Enshu, Limited. Apparatus for detecting success in weft insertion of shuttleless looms. 3,978,893, Cl. 139-370.200.

Indian Head Inc.: *See—*
Trifunovic, Alexander L.; Hills, William H.; Borgman, Milton H.; and Mersereau, Emory P., 3,978,561.

Inertia Switch Limited: *See—*
Forbat, John Egon; Digby, John Robert; and Roper, Timothy Alan, 3,979,740.

Ingram, Brian; and Harries, David Anthony, to Girling Limited. Master cylinder assemblies for vehicle hydraulic braking systems. 3,979,153, Cl. 303-6.00R.

Injection Plastic Co., Inc., The: *See—*
Strang, Robert E., 3,979,099.

Inmont Corporation: *See—*
Bryant, Earle Ruskin; and Weis, Joseph August, 3,979,344.

Inoue, Souichi; Kato, Katsumi; and Marumo, Yoshiharu, to Kabushiki Kaisha Seikosha. Apparatus for adjusting a frequency of an oscillating element provided a hair spring. 3,978,750, Cl. 83-208.000.

Institute Po Technicheska Kibernetika pri Ban: *See—*
Naplatanov, Nicolay Delchev; Sgurov, Vasil Stoyanov; Petrov, Peter Anguelov; Nicolov, Zdravko Alexandrov; Ganchev, Alexander Ivanov; and Trendafilov, Stefan Petrov, 3,979,731.

Interbath, Inc.: *See—*
Zieger, Claus D., 3,979,096.

International Acceptor Corporation of Florida: *See—*
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International Business Machines Corporation: *See—*
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Bhattacharyya, Arup; Joshi, Madhukar Laxman; Kroll, Charles Thomas; and Silverman, Ronald, 3,978,577.
Bringol, Charles Ronald, 3,979,651.
Caragliano, Edward S.; and Nick, Howard H., 3,979,699.
Catron, Brittain Norman; Dumstorff, Eugene Francis; Schloss, Phillip Christian; and Schroeder, Larry Lloyd, 3,979,727.
Helinski, Edward F.; and Zable, Jack L., 3,979,756.
Hughes, David Robert; and Polischuk-Sawtschenko, Alexander, 3,979,723.
Meeker, Robert G.; Scanlon, William J.; and Segal, Zvi, 3,979,671.
Mulzet, Alfred Paul; and Sirico, James Louis, 3,978,992.
Pelc, Rafael, 3,979,643.
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International Computers Limited: *See—*
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International Environmental Dynamics, Inc.: *See—*
Labie, Allan S.; Lew, Irwin Paul; Gutman, Abraham; and Thornton, Charles, 3,978,630.

International Harvester Company: *See—*
Brudnak, Andrew, Jr., 3,978,597.
Joscher, Alfred J.; and Boone, Theodore F., 3,978,938.
Selzer, Robert J., 3,978,740.

International Paper Company: *See—*
Royal, Thomas B., 3,978,774.

International Power Technology: *See—*
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International Standard Electric Corporation: *See—*
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Poma, Mario, 3,979,676.
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International Telephone and Telegraph Corporation: *See—*
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Gordon, Robert, 3,979,610.
Groce, John C., 3,979,700.
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Titcomb, Stanley T.; and Juers, Arthur A., 3,979,523.
Wedding, William Ray; and Kiss, John David, 3,978,590.

Inventec International Limited: *See—*
Hickman, Ronald P.; Luff, Brian Anthony; Rossell, Edgar Ronald; and Bernard, Derek John Charles, 3,978,944.

Ionics Lyo Products Company: *See—*
McRae, Wayne A.; and Reed, Philip B., 3,978,855.

IRD Mechanalysis, Inc.: *See—*
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Irion, Leonhard: *See—*
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Isaac, Kenneth N.: *See—*
Disparte, Charles P.; Hall, Warren L., Jr.; Isaac, Kenneth N.; and Mock, C. Howard, 3,979,725.

Iser-Iser, Herbert. Heel binding for cross country skis. 3,979,132, Cl. 280-614.000.

Ishida, Kunio, to Tokico Ltd. Locking device in gas spring. 3,979,109, Cl. 267-64.00R.

Ishii, Kiyoshi: *See—*
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Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Kameda, Shinya; Nagashima, Shunzaburo; and Obi, Mikio, 3,978,889.

Ishimathu, Yoshiaki: *See—*
Fujii, Chiyuki; Yasui, Moroshi; and Ishimathu, Yoshiaki, 3,979,457.

Ishiyama, Koichi; Sakata, Yuji; and Wada, Ikuo, to Ebara Udylite Kabushiki Kaisha. Method for treating and rinsing metal articles. 3,979,220, Cl. 134-10.000.

Itami, Franklin Satoshi: *See—*
Taggart, William Devore, Jr.; and Itami, Franklin Satoshi, 3,979,771.

Ito, Shyogo; and Mizutani, Hiroshi, to Teijin Limited; Kitanippon Dyeing & Finishing Co., Ltd.; and Nippon Dyeing Machine Manufacturing Co., Ltd. Apparatus for continuously relaxing a textile fabric. 3,978,696, Cl. 68-158.000.

Ito, Toshio; Hibino, Masahiro; and Kohya, Tetsuya, to Mitsubishi Denki Kabushiki Kaisha. Induction heating apparatus. 3,979,572, Cl. 219-10.490.

Ito, Yoshio: *See—*
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Nakagawa, Yunosuke; Sugiura, Shigetsugu; Matsunaga, Kinjiro; and Ito, Yoshio, 3,979,313.

ITT Industries, Inc.: *See—*
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Gollinger, Wolfgang, 3,979,698.
Nordentoft, Lars, 3,979,064.
Winter, Klaus, 3,978,570.

Ivester, Andrew S.: *See—*
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Iwabuchi, Shunji: *See—*
Arakawa, Yoshihiro; Nakashima, Akio; Iwabuchi, Shunji; and Ando, Kenji, 3,979,641.

Iwase, Hiroo; and Ninomiya, Satoshi, to Hitachi, Ltd. Seal device for use in flange mating surfaces of vacuum container. 3,979,014, Cl. 220-240.000.

Iwatsu Electric Co., Ltd.: *See—*
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Izumi Jiko Co., Ltd.: *See—*
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Izyneev, Anatoly Andreevich: *See—*
Alexeev, Nikolai Efimovich; Buzhinsky, Igor Mikhailovich; Zhabotinsky, Mark Efremovich; Izyneev, Anatoly Andreevich; Koryagina, Elizaveta Ivanovna; Kravchenko, Valery Borisovich; Rudnitsky, Jury Petrovich; Gapontsev, Valentin Pavlovich; and Tsapkin, Vadim Vasilievich, 3,979,322.

J. I. Case Company: *See—*
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J. P. Stevens & Co., Inc.: *See—*
Pike, Herbert J., 3,978,558.

Jaaskelainen, Erkki Kalle. Compass, in particular for ski and competition track finding. 3,978,591, Cl. 33-334.000.

Jackman, Robert M., to A. O. Smith-Inland, Inc. Pipe joint make up tool. 3,978,572, Cl. 29-237.000.

Jacobs, Eckart: *See—*
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Jacobs, Harold: *See—*
Chrepta, Metro M.; and Jacobs, Harold, 3,979,272.

Jacobs, Martin E., to United States of America, Energy Research and Development Administration. Circuit for monitoring temperature of high-voltage equipment. 3,978,729, Cl. 73-359.00R.

Jaffe, Edward Ephraim; Marshall, William Joseph; and Stefancsik, Ernest Anton, to Du Pont de Nemours, E. I., and Company. Yellow azo pigment and process of preparation from dichloroaniline and barbituric acid. 3,979,377, Cl. 260-154.000.

Jager, Horst, to Ciba-Geigy Corporation. Polyfluoroalkyl iodides, process for their manufacture, and their use. 3,979,469, Cl. 260-653.000.

Jaillet, Andre; Pelletier, Andre; and Thieulent, Jean-Pierre, to Thomson-CSF. Travelling-wave tube with an improved electron gun. 3,979,634, Cl. 315-3.500.

Jamison, Will B.; and Burr, John F., to Consolidation Coal Company. Energy conversion apparatus for supplying variable voltage direct current power to an electrically propelled vehicle. 3,979,650, Cl. 318-150.000.

Janson, Sven-Olof. Electric heating element control circuit. 3,979,576, Cl. 219-489.000.

Janssen, Jos M., to JMJ Werkzeugmaschinen GmbH fuer Feinbearbeitung. Machine for surface-, plane-parallel-, and plain lapping. 3,978,621, Cl. 51-111.00R.

Janssens, Wilhelmus; Vanheertum, Johannes Josephus; Poot, Albert Lucien; and Pollet, Robert Joseph, to AGFA-GEVAERT N.V. Duplo quinoline compounds. 3,979,394, Cl. 260-283.0BZ.

Japan Monopoly Corporation, The: *See—*
Uehara, Minoru; Maeda, Kazuo; Fujii, Shoji; and Nishio, Hiromu, 3,978,869.

Japan Synthetic Rubber Co., Ltd.: *See—*
Nishibata, Shiyuji; Hirose, Kazumasa; Harada, Kunihara; and Fukumori, Tokuro, 3,979,358.

Jaques, Michael J. Steel tape and wire puller. 3,979,106, Cl. 254-134.3FT.

Jarrett, Bobby R., to United States of America, Navy. High-speed Manchester code demodulator. 3,979,746, Cl. 340-347.0DD.

Jeanson, Richard L., to Menasha Corporation. Sheet molding compound. 3,979,539, Cl. 428-126.000.

Jefferson Chemical Company, Inc.: *See—*
Rowton, Richard Lee, 3,979,364.

Jemco Engineering Co.: *See—*
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Jenaer Glaswerk Schott & Gen.: *See—*
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Jenkins, Cecil: *See—*
Woolslayer, Homer J.; and Jenkins, Cecil, 3,978,994.

Jenkins, Philip Peter; and Lewis, Stanley, to Coal Industry (Patents) Limited. Mine roof support equipment. 3,978,675, Cl. 61-45.00F.

Jennings, Thomas A., to Hull Corporation. Shielded inductance coil with trimmer. 3,979,706, Cl. 336-83.000.

Jespersen, Aksel, to Danfoss A/S. Apparatus for adjusting and indicating the operating curve of a weather-responsive heating regulator. 3,979,710, Cl. 338-91.000.

Jezl, James L.: *See—*
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Jimenez, Ramon. Portable window-attached emergency descent mechanism. 3,978,942, Cl. 182-75.000.

JMJ Werkzeugmaschinen GmbH fuer Feinbearbeitung: *See—*
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Johan, Bela; Szemler, Laszlo; Szontagh, Tamas; Kuti, Laszlo; Simonovits, Emilia; Bekes nee Erdos, Judit; Szekely, Denes; Kiss, Janos; Kovacs nee Komoroczy, Erzsebet; and Hargitai nee Franyo, Aniko, to Richter Gedeon Vegyeszeti Gyar Rt. Process for the production of fermentation broth with increased vitamin B_{12} content by synchronizing the bacterium population. 3,979,259, Cl. 195-28.0VB.

John J. McMullen Associates, Inc.: *See—*
Cuneo, Joseph J.; and Mertl, Ivan, 3,978,808.

John Wyeth & Brother: *See—*
Newberry, Robert Anthony; and Bushell, Brian John, 3,979,402.

Johns-Manville Corporation: *See—*
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Johnson, Bruce K.: *See—*
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Johnson, James E.: *See—*
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Johnson, James S.: *See—*
Brickner, David R.; and Johnson, James S., 3,979,090.

Johnson, Joseph L.; and Guidry, Shelby L., to Schlumberger Technology Corporation. Gas storage well safety valve apparatus. 3,978,922, Cl. 166-224.00A.

Johnson, Justin O., Jr.: *See—*
Guicheteau, Eugene H.; and Johnson, Justin O., Jr., 3,979,654.

Johnson Matthey & Co., Limited: *See—*
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Richardson, Robert L.; and Johnston, Norris, 3,978,588.

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Jones, Robert J.: *See—*
Epina, August P.; Olmsted, Dennis R.; Platter, Sanford; Jones, Robert J.; and Marion, Jack L., 3,978,546.

Jones, Ronald E.: *See—*
Kolaian, Jack H.; Jones, Ronald E.; Crawford, Wheeler C.; and Cummings, William M., 3,979,307.

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Joseph, James B.: *See—*
Johnson, William T., Jr.; and Joseph, James B., 3,978,757.

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Judaev, Alexandr Ivanovich: *See—*
Golovko, Georgy Anatolievich; Lipkind, Boris Alexandrovich; Slepneva, Albina Timofeevna; Leontiev, Alexandr Semenovich; Mazin, Vladimir Mikhailovich; Berezovskaya, Elena Nikolaevna; Burylov, Valentin Alexandrovich; Zubkov, Alexandr Mikhailovich; Konakova, Olga Alexeevna; Judaev, Alexandr Ivanovich; Pavlychev, Valentin Nikolaevich; Ignatov, Jury Yakovlevich; and Kharitonov, Evgeny Alexandrovich, 3,979,335.

Juers, Arthur A.: *See—*
Titcomb, Stanley T.; and Juers, Arthur A., 3,979,523.

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Clemente, A. Harry; and Clemente, Alfredo A., 3,979,145.

Juntgen, Harald: *See—*
Munzner, Heinrich; Heimbach, Heinrich; Korbacher, Werner; Peters, Werner; Juntgen, Harald; Knoblauch, Karl; and Zundorf, Dieter, 3,979,330.

Jurasek, Stanley J., to Eagle-Picher Industries, Inc. Rigid container. 3,979,006, Cl. 220-19.000.

Juriev, Jury Nikolaevich: *See—*
Moskovich, Jury Leonidovich; Juriev, Jury Nikolaevich; Tsyekovsky, Viktor Karlovich; Berezova, Ljudmila Vasilievna; Gilchenok, Nokhum Davidovich; Yanshevsky, Vladimir Avgustovich; Mushenko, Dmitry Vasilievich; Zelikman, Evgeny Semenovich; Filippova, Rufina Alexandrovna; Klimenko, Vladimir Leonidovich; and Sobolev, Valerian Mikhailovich, 3,979,450.

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Kabushiki Kaisha Seikosha: *See*—
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Araki, Hidejiro; and Otani, Susumu, 3,978,552.

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Kalniv, Ilmar L.: *See*—
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Kameda, Shinya; Nagashima, Shunzaburo; and Obi, Mikio, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Steam supply control device. 3,978,889, Cl. 137-630.140.

Kamenkovich, Anatoly Samoilovich: *See*—
Glagovsky, Boris Aronovich; Kamenkovich, Anatoly Samoilovich; Lysanov, Vladislav Sergeevich; Moskovenko, Igor Borisovich; Roitshtein, Garri Shmilevich; Slavina, Ljudmila Yakovlevna; Feldgun, Leon Izrailevich; Frenkel, Larisa Ruvimovna; Khait, Alexandr Lazarevich; Shashkina, Galina Alexandrovna; Yashin, Veniamin Alexandrovich; Kremen, Zinovy Illich; and Muzykant, Yakov Abramovich, 3,978,711.

Kamensky, Veniamin Viktorovich: *See*—
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Prokai, Bela; and Kanner, Bernard, 3,979,420.

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Kao, Wenling: *See*—
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Kato, Toshiki: *See*—
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Katsube, Junki: *See*—
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Keith, Garland B.: *See*—
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Kelley, Robert D.: *See*—
Gardner, Richard H.; and Kelley, Robert D., 3,978,945.

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Ketcham, David J.: *See*—
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Khait, Alexandr Lazarevich: *See*—
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Kienzle Uhrenfabriken GmbH: *See*—
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Kilby, Jack S.; and Lathrop, Jay W. Electrostatic head with toner attracting plates. 3,979,758, Cl. 346-74.0EH.

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King Industries, Inc.: *See—*
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Kiss, Pal: *See—*
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Kitano, Kazuaki: *See—*
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Kjelgaard, William L.; and Anderson, Paul M., to Research Corporation. Method and apparatus for the adiabatic expansion of liquid anhydrous ammonia. 3,978,681, Cl. 62-51.000.

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Klauke, Erich: *See—*
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Klisch, Stephen Cajetan; and Martin, Charles Andrew, to Colgate-Palmolive Company. Olefin sulfonate detergent compositions. 3,979,340, Cl. 252-548.000.

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Knodler, Diethelm; and Irion, Leonhard, to Siemens Aktiengesellschaft. Boiling-water reactor. 3,979,257, Cl. 176-54.000.

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Kober, Ehernfried H.: *See—*
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Kolaian, Jack H.; Jones, Ronald E.; Crawford, Wheeler C.; and Cummings, William M., to Texaco Inc. Fabric softener composition. 3,979,307, Cl. 252-8.750.

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Konakova, Olga Alexeevna: *See—*
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Kosaka, Kenzo; Horikawa, Toshio; Uchida, Minoru; Morioka, Shin; Shibata, Kunio; and Takahashi, Eizi, to Mitsubishi Rayon Co., Ltd. Highly coherent and rigid synthetic multifilamentary yarn and process for manufacturing the same. 3,978,647, Cl. 57-140.00R.

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Krafft, Kurt, to Systems Design & Development. Powder room and bathroom system. 3,978,529, Cl. 4-2.000.

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Kremen, Zinovy Illich: *See—*
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Lysanov, Vladislav Sergeevich; Moskovenko, Igor Borisovich; Roitshtein, Garri Shmilevich; Slavina, Ljudmila Yakovlevna; Feldgun, Leon Izrailevich; Frenkel, Larisa Ruvimovna; Khait, Alexandr Lazarevich; Shashkina, Galina Alexandrovna; Yashin, Veniamin Alexandrovich; Kremen, Zinovy Illich; and Muzykant, Yakov Abramovich, 3,978,711.

Kremer, David G.; and Chu, Mosi, to Sperry Rand Corporation. Copying machine fire snuffer. 3,979,161, Cl. 355-133.000.

Kremers-Urban Company: *See—*
Stahmann, Mark A.; and Wagle, Sudhakar S., 3,979,508.

Krenzer, John, to Velsicol Chemical Corporation. Thiadiazolylletrahydropyrimidinones. 3,979,388, Cl. 260-256.50R.

Kriger, Jury Nikolaevich: *See—*
Rabinovich, Volf Iudovich; Kriger, Jury Nikolaevich; Svitenko, Igor Alexandrovich; Sapunov, Viktor Evgenievich; and Filippov, Vyacheslav Vasilievich, 3,978,907.

Krimm, Heinrich; Buysch, Hans-Josef; and Freitag, Dieter, to Bayer Aktiengesellschaft. Condensation resins of phenols and α,α'-dihydroxy-diisopropyl benzenes. 3,979,462, Cl. 260-619.00B.

Krishna, Surinder: *See—*
Houston, Douglas E.; Krishna, Surinder; and Baliga, Bantval Jayant, 3,979,769.

Kristen, Klaus: *See—*
Scheidler, Herwig; and Kristen, Klaus, 3,978,633.

Kroger, Hanns H.; Acree, Stuart F.; and Akridge, Allen P., to General Electric Company. Electrochemical impregnation of electrode for rechargeable cell. 3,979,223, Cl. 204-24.000.

Kroger, Harry; and Wegener, Horst A. R., to Sperry Rand Corporation. Multi-terminal controlled-inversion semiconductor devices. 3,979,613, Cl. 307-304.000.

Kroll, Charles Thomas: *See—*
Bhattacharyya, Arup; Joshi, Madhukar Laxman; Kroll, Charles Thomas; and Silverman, Ronald, 3,978,577.

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Kiovsky, Thomas E.; and Kromer, Richard C., 3,979,374.

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Kruse, Werner; and Resch, Reinhard, to Daimler-Benz Aktiengesellschaft. Multi-circuit brake installation for vehicles. 3,978,670, Cl. 60-562.000.

Krutenat, Richard Carroll: *See—*
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Kubota, Ltd.: *See—*
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Kuchnir, Moyses, to Wisconsin Alumni Research Foundation. Expansion joint lock for low temperature structures. 3,979,164, Cl. 403-28.000.

Kuchuk-Yatsenko, Sergei Ivanovich; Solodovnikov, Sergei Alexandrovich; Sakharnov, Vasily Alexeevich; Golomovzjuk, Ivan Korneevich; Kulesh, Alexandr Ivanovich; and Porkhun, Fedor Konstantinovich. Device for removing flash after resistance butt welding of rails. 3,978,746, Cl. 83-1.000.

Kudchadker, Mohan V.; and Walker, Thad O., to Texaco Inc. Alkoxylated asphalts as sacrificial agents in oil recovery processes. 3,978,927, Cl. 166-273.000.

Kugele, Thomas G.; and Koeniger, Arthur F., to Cincinnati Milacron Chemicals, Inc. Carbofunctional sulfur and carboxylate bridged tin compounds. 3,979,359, Cl. 260-45.75S.

Kuhlman Corporation: *See—*
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Kuhn, Charles W., to Caterpillar Tractor Co. Duplex filter system. 3,979,292, Cl. 210-90.000.

Kulesh, Alexandr Ivanovich: *See—*
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Kullman, Russell M. H.: *See—*
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Kuroda, Nobukazu, to Sony Corporation. Magnetic Ni-Cr-Mn-Ge-Fe alloy. 3,979,233, Cl. 148-31.550.

Kurz, Dietrich: *See—*
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Kushida, Masagoro: *See—*
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Kuti, Laszlo: *See—*
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Kvita, Vratislav; Darms, Roland; and Greber, Gerd, to Ciba-Geigy Corporation. Imidyl- and isoimidyl-phthalic anhydrides, process for their manufacture and their use for curing epoxide resins. 3,979,393, Cl. 260-281.00G.

Kwan, Okun, to Bunker Ramo Corporation. Magnetic head control assembly for a magnetic passbook printing system. 3,978,964, Cl. 197-127.00R.

Kwikform Limited: *See—*
Mack, Roy; and Mayo, Terence William, 3,978,634.

L. B. Smith Estates, Inc.: *See—*
Smith, Luther B., deceased, 3,978,864.

La Telemecanique Electrique: *See—*
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Laas, Daniel; Waldmann, Herrmann; and Wolf, Josef, to Siemens Aktiengesellschaft. Apparatus for monitoring a redundant multichannel analog system. 3,979,720, Cl. 340-146.1BE.

Labie, Allan S.; Lew, Irwin Paul; Gutman, Abraham; and Thornton, Charles, to International Environmental Dynamics, Inc. Central tower building with ground constructed hoisted and supported floors. 3,978,630, Cl. 52-236.000.

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Laing, Nikolaus. Rotary heat exchangers in the form of turbines. 3,978,660, Cl. 60-39.51R.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
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Lambert, Claude: *See—*
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Lancellotti, William E. Golf putter practice device. 3,979,125, Cl. 273-186.00A.

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Lange, Ralf: *See—*
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Lange, Ronald Edwin; Dobberstein, Riley H.; and Webber, Steven Hugh, to Honeywell Information Systems, Inc. Apparatus for selectively clearing a cache store in a processor having segmentation and paging. 3,979,726, Cl. 340-172.500.

Langen & Co.: *See—*
Strauff, Gunther, 3,978,770.

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Kilby, Jack S.; and Lathrop, Jay W., 3,979,758.

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Dryla, Ronald, 3,978,887.
English, Robert, 3,978,609.
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Honig, Edith M., 3,978,553.
Huston, Robert B., 3,978,871.
Kleinpeter, Joseph, 3,979,579.
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Rasoulinejad, Seyd M., 3,978,600.
Wilkens, Arnold J., 3,978,844.

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Lee, John J.: *See—*
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Leonard, John P., to United States of America, Army. Guided missile using fluidic sensing and steering. 3,979,085, Cl. 244-3.150.

Leontiev, Alexandr Semenovich: *See—*
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Lesk, Adolf, to AZO-Maschinenfabrik Adolf Zimmermann. Method of and apparatus for the admixing of a pigment color in a dosaged manner into a plastics material granulate. 3,979,107, Cl. 259-10.000.

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Lever Brothers Company: *See—*
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Lew, Irwin Paul: *See—*
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Lewis, Richard Newton, to SWS Silicones Corporation. Alkoxysiloxanol modified surfaces. 3,979,546, Cl. 428-394.000.

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Li, George S.; and Coffey, Gerald P., to Standard Oil Company. Process for the color stabilization of indene. 3,979,473, Cl. 260-674.00R.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
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Lif-O-Gen, Inc.: *See—*
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Lin, Chung Sing. Comb with disposable comb-teeth module. 3,978,870, Cl. 132-11.00R.

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Lipscomb, Orange Ray, Jr.; and Sales, Edward Bernard. Motorcycle trailer. 3,979,137, Cl. 280-402.000.

List, Hans: *See—*
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Logica International Corporation: *See—*
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Lohse, Friedrich: *See—*
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Longwith, Chester C.: *See—*
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Lu, Chien Shiong, to Westinghouse Electric Corporation. Unbalance pressure actuator for a flow control apparatus having noise and vibration reducing arrangement thereon. 3,978,885, Cl. 137-560.000.

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Lydtin, Hans-Jurgen: *See—*
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Lyle, Frank E., to American Home Products Corporation. Can inverting and cleaning apparatus. 3,978,972, Cl. 198-836.000.

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Lysanov, Vladislav Sergeevich: *See—*
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Maahs, Werner H., to M & M Enterprises, Inc. Portable electric oven. 3,979,575, Cl. 219-407.000.
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Maeda, Kazuo; and Matsui, Bunya, to Fujitsu Ltd. Method of etching films of silicon nitride and silicon dioxide. 3,979,241, Cl. 156-13.000.
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Maginness, Maxwell G.; Meindl, James D.; and Plummer, James D., to Leland Stanford Junior University, The Board of Trustees of. Ultrasonic transducer array and imaging system. 3,979,711, Cl. 340-1.00R.
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Cameron, Neil McIver; Thatcher, Kenneth Cyril; and Mallinder, Frederick Paul, 3,979,493.
Malo, Lowell L., to ACF Industries, Incorporated. Box car antipilferage device for plug doors. 3,978,618, Cl. 49-449.000.
Mandrin, Charles; and Ergenc, Mehmet Sahabettin, to Sulzer Brothers Limited. Process and apparatus for evaporating and heating liquified natural gas. 3,978,663, Cl. 60-39.670.
Manesty Machines, Ltd.: *See*—
Crossley, Jack; and Wilson, David Henry, 3,978,640.
Marchetti, Michael J., to Sperry Rand Corporation. Battery operated appliance. 3,979,228, Cl. 429-99.000.
Marconi, Gary G.; and Hoehn, Marvin M., to Eli Lilly and Company. 1,6-Di-O-(2-isocyano-3-methylcrotonyl)-D-mannitol compounds. 3,979,433, Cl. 260-465.400.
Marino, Thomas; Kreeft, John; and Stanislaw, Peter, to Morrison Machine Co. Drive means for cylindrical screen printer. 3,978,787, Cl. 101-115.000.
Marinsky, Georgy Sergeevich: *See*—
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Boiko, Georgy Alexandrovich; Kumysh, Ilya Iosifovich; Puzrin, Leonid Gustavovich; Kovalev, Viktor Alexandrovich; Marinsky, Georgy Sergeevich; Beloglazov, Alexandr Petrovich; Siry, Pavel Osipovich; Sopozhnikov, Alexandr Ivanovich; Nosanov, Valentin Alexandrovich; Babinovich, Volf Iudovich; Popov, Lev Vasilievich; Shelkov, Sergei Mikhailovich; Strukov, Vladimir Nikolaevich; and Babich, Boris Markovich, 3,979,101.
Marion, Jack L.: *See*—
Epina, August P.; Olmsted, Dennis R.; Platter, Sanford; Jones, Robert J.; and Marion, Jack L., 3,978,546.
Markijohn, Darrell W.: *See*—
Conrow, Jonathan M.; Radzykewycz, Myron; and Markijohn, Darrell W., 3,978,971.
Markley, Finley W., to United States of America, Energy Research and Development Administration. Folded membrane dialyzer with mechanically sealed edges. 3,979,295, Cl. 210-321.00B.
Marritt, Clifford Russell: *See*—
Williams, Robert Ernest; and Marritt, Clifford Russell, 3,978,969.
Marsh, Anthony, to Plessey Handel und Investments A.G. Circular magnetic domain devices. 3,979,736, Cl. 340-174.0TF.
Marsh, Arthur H.: *See*—
Gagnon, Forrest W.; and Marsh, Arthur H., 3,979,091.
Marshall, William Joseph: *See*—
Jaffe, Edward Ephraim; Marshall, William Joseph; and Stefancsik, Ernest Anton, 3,979,377.
Martin, Charles Andrew: *See*—
Klisch, Stephen Cajetan; and Martin, Charles Andrew, 3,979,340.
Martin, David James Reginald, to Coal Industry (Patents) Limited. Radiating telecommunication systems switching. 3,979,673, Cl. 325-2.000.
Martin, David James Reginald, to Coal Industry (Patents) Limited. Radiating telecommunication systems. 3,979,674, Cl. 325-4.000.
Martin, Wayne. Window frame apparatus for vehicles. 3,979,148, Cl. 296-137.00B.
Martinez-Alvarez, Francisco; Briones, Antonio Gamero; and Buron, Enrique Dominguez, to Sociedad Anonima Cros. Dichlorocyanurate silver complexes. 3,979,382, Cl. 260-242.000.
Marumo, Yoshiharu: *See*—
Inoue, Souichi; Kato, Katsumi; and Marumo, Yoshiharu, 3,978,750.
Maruniak, Adam, to Meto-Plast Corporation. Floating fish grip. 3,978,605, Cl. 43-5.000.
Maruyama, Isamu: *See*—
Sasajima, Kikuo; Ono, Keiichi; Nakao, Masaru; Maruyama, Isamu; Takayama, Masaharu; Katayama, Shigenari; Katsube, Junki; Inaba, Shigeho; and Yamamoto, Hisao, 3,979,390.
Marx, Jon A.: *See*—
Boris, Paul A.; and Marx, Jon A., 3,979,087.
Masanek, Juergen: *See*—
Fink, Herbert; Pennewiss, Horst; Plainer, Hermann; Trabitzsch, Hans; Frieser, Josef; and Masanek, Juergen, 3,979,349.
Maschinenfabrik Augsburg-Nurnberg AG: *See*—
Simon, Michael, 3,978,823.
Masuda Manufacturing Co., Ltd.: *See*—
Masuda, Masao, 3,978,556.
Masuda, Masao, to Masuda Manufacturing Co., Ltd. Processing system for woven, knit or similar shaped materials. 3,978,556, Cl. 68-62.000.
Matchick, John T. Stride-box. 3,979,116, Cl. 273-26.00R.
Mathis, Cleo D. Backflow safety valve for therapy pools. 3,978,886, Cl. 137-565.000.
Matsui, Bunya: *See*—
Maeda, Kazuo; and Matsui, Bunya, 3,979,241.
Matsunaga, Kinjiro: *See*—
Nakagawa, Yunosuke; Sugiura, Shigetsugu; Matsunaga, Kinjiro; and Ito, Yoshio, 3,979,312.
Nakagawa, Yunosuke; Sugiura, Shigetsugu; Matsunaga, Kinjiro; and Ito, Yoshio, 3,979,313.
Matsushita Electric Industrial Co., Ltd.: *See*—
Fukai, Masakazu; Asai, Komei; Nagata, Seiichi; Tatsuta, Hiroshi; and Mori, Koshiro, 3,979,319.
Sakamoto, Yoichi, 3,979,680.
Matthey Rustenburg Refiners (Proprietary): *See*—
MacGregor, John James, 3,979,207.
Matty, Thomas C., to Westinghouse Electric Corporation. Failsafe controlled gain inverting amplifier apparatus. 3,979,690, Cl. 330-107.000.
Matz, Bjorn J., to Dictaphone Corporation. Power supply apparatus having an output voltage within a limited range regardless of input voltage variations and having minimal power dissipation. 3,979,661, Cl. 321-18.000.
Mauriello, Francis G., to Diamond Crystal Salt Company. Method and apparatus for making packet assemblies. 3,978,637, Cl. 53-28.000.
Mayer, John W. Ambidextrous scissors. 3,978,584, Cl. 30-256.000.
Mayo, Terence William: *See*—
Mack, Roy; and Mayo, Terence William, 3,978,634.
Maytag Company, The: *See*—
Mellinger, John C.; and McNally, William J., 3,978,960.
Maytham, Walter J., to Speed Systems, Inc. Cable insulation stripping tool. 3,978,582, Cl. 30-90.100.
Mazer Corporation, The: *See*—
Panken, Irving, 3,979,550.
Mazin, Vladimir Mikhailovich: *See*—
Golovko, Georgy Anatolievich; Lipkind, Boris Alexandrovich; Slepneva, Albina Timofeevna; Leontiev, Alexandr Semenovich; Mazin, Vladimir Mikhailovich; Berezovskaya, Elena Nikolaevna; Burylov, Valentin Alexandrovich; Zubkov, Alexandr Mikhailovich; Konakova, Olga Alexeevna; Judaev, Alexandr Ivanovich; Pavlychev, Valentin Nikolaevich; Ignatov, Jury Yakovlevich; and Kharitonov, Evgeny Alexandrovich, 3,979,335.
Mazur, Robert G.; Gruber, Gilbert A.; and Stephenson, Robert C., to Solid State Measurements, Inc. Lapping and polishing apparatus. 3,978,622, Cl. 51-119.000.

McCallister, Robert A., to Foster Wheeler Energy Corporation. Partial oxidation carbon removal process. 3,979,188, Cl. 48-215.000.
McCan, John J., to Polaroid Corporation. Photoflash filter. 3,979,583, Cl. 240-1.300.
McCloskey, Thomas H.: *See—*
LaCoste, Bernard L.; and McCloskey, Thomas H., 3,979,104.
McConnaughay, Esther L., executrix: *See—*
Spahr, John; McConnaughay, Kenneth E., deceased; and McConnaughay, Esther L., executrix, 3,979,323.
McConnaughay, Kenneth E., deceased: *See—*
Spahr, John; McConnaughay, Kenneth E., deceased; and McConnaughay, Esther L., executrix, 3,979,323.
McCormick, Joseph B., to United States of America, Army. Rocket catapult. 3,979,088, Cl. 244-122.0AB.
McCoy, David R.; and Kablaoui, Mahmond S., to Texaco Inc. Method of preparation of sulfonated, dialkyl-substituted benzodioxoles. 3,979,415, Cl. 260-340.500.
McCullough, Ira J.; Lee, Albert J.; and Sullivan, John G. Access controller and system. 3,979,578, Cl. 235-61.11E.
McDill, Richard T.: *See—*
Mead, Theodore C.; McDill, Richard T.; Chesluk, Ralph P.; and Odell, Norman R., 3,979,308.
McDonald, Daniel McLean. Record players. 3,979,127, Cl. 274-10.00R.
McGillick, Raymond, to Lawrence Peska Associates, Inc., a part interest. Time clock. 3,978,655, Cl. 58-126.00R.
McGraw-Edison Company: *See—*
Hoag, Kip J., 3,979,485.
McIntyre, Howard L., to Armstrong Cork Company. Secondary headbox for overlay application in board formation. 3,979,254, Cl. 162-299.000.
McLennan, William S.; and Potts, George C., deceased (by Potts, Mary P., executrix), to United States of America, Army. Muzzle-expellable cartridge. 3,978,793, Cl. 102-38.000.
McLeroy, David: *See—*
Primich, Theodore; Strilich, David A.; and McLeroy, David, 3,978,703.
McNally, William J.: *See—*
Mellinger, John C.; and McNally, William J., 3,978,960.
McNeal, James Clifton: *See—*
Olson, Wallace Fred; and McNeal, James Clifton, 3,978,933.
McNeely, William H.: *See—*
Kang, Kenneth Suk; and McNeely, William H., 3,979,303.
McPhee, Charles J., to American Hospital Supply Corporation. System with filter for administrating parenteral liquids. 3,978,857, Cl. 128-214.00R.
McRae, Wayne A.; and Reed, Philip B., to Ionics Lyo Products Company. Polyurethane foam surgical dressing. 3,978,855, Cl. 128-156.000.
McShane, James L., to Westinghouse Electric Corporation. Metal enclosed transducer assembly. 3,979,565, Cl. 179-110.00A.
Mead Corporation, The: *See—*
Duncan, Richard K., 3,978,982.
Mead Johnson & Company: *See—*
Gallo, Duane G.; and Comer, William T., 3,979,514.
Mead, Theodore C.; McDill, Richard T.; Chesluk, Ralph P.; and Odell, Norman R., to Texaco Inc. Lubricant compositions with improved viscosity index. 3,979,308, Cl. 252-32.500.
Meaden Screw Products Company: *See—*
Meaden, Thomas F.; and Fieberg, George W., 3,978,752.
Meaden, Thomas F.; and Fieberg, George W., 3,978,753.
Meaden, Thomas F.; and Fieberg, George W., to Meaden Screw Products Company. Intermittent perforator wheel. 3,978,752, Cl. 83-678.000.
Meaden, Thomas F.; and Fieberg, George W., to Meaden Screw Products Company. Adjustable perforator wheel. 3,978,753, Cl. 83-678.000.
Means, Rodney J.: *See—*
Hepworth, Edward C.; and Means, Rodney J., 3,979,732.
Medovar, Boris Izrailevich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Boiko, Georgy Alexandrovich; Kumysh, Ilya Iosifovich; Puzrin, Leonid Gustavovich; Kovalev, Viktor Alexandrovich; Marinsky, Georgy Sergeevich; Beloglazov, Alexandr Petrovich; Siry, Pavel Osipovich; Sopozhnikov, Alexandr Ivanovich; Nosanov, Valentin Alexandrovich; Babinovich, Volf Iudovich; Popov, Lev Vasilievich; Shelkov, Sergei Mikhailovich; Strukov, Vladimir Nikolaevich; and Babich, Boris Markovich, 3,979,101.
Meeker, Robert G.; Scanlon, William J.; and Segal, Zvi, to International Business Machines Corporation. Test fixture for use in a high speed electronic semiconductor chip test system. 3,979,671, Cl. 324-158.00F.
Megga, Daniel H.: *See—*
Rose, Bernard R.; Megga, Daniel H.; and Beny, Janos, 3,978,598.
Megumi, Naomitsu, to Tokyo Plywood Kabushiki Kaisha; and Megumi, Naomitsu. Structural unit body having a pipe incorporated therein and a structure assembled therefrom. 3,978,916, Cl. 165-49.000.
Meindl, James D.: *See—*
Maginness, Maxwell G.; Meindl, James D.; and Plummer, James D., 3,979,711.
Mellinger, John C.; and McNally, William J., to Maytag Company, The. Coin authenticating slide mechanism. 3,978,960, Cl. 194-55.000.
Meloy Laboratories, Inc.: *See—*
Stahl, Quade R., 3,979,301.
Menasha Corporation: *See—*
Frater, James J., 3,979,016.
Jeanson, Richard L., 3,979,539.
Mencacci, Samuel A.; and Niemann, Gary O., to FMC Corporation. Carbonated beverage filler. 3,978,900, Cl. 141-11.000.
Merchant, Alan C. Knee support and cassette holder for axial X-rays of the knees. 3,979,595, Cl. 250-451.000.
Merck & Co., Inc.: *See—*
Axelrod, Eugene H., 3,979,452.
Firestone, Raymond A.; Fahey, John L.; and Christensen, Burton G., 3,979,384.
Kang, Kenneth Suk; and McNeely, William H., 3,979,303.
Schultz, Everett M.; and Cragoe, Edward J., Jr., 3,979,361.
Meritzis, Athanassios N. Vehicle propelled by reciprocating occupant motion. 3,979,135, Cl. 280-226.00R.
Merkel, Rudolf; Schnell, Friedrich; and Weber, Ewald, to Werkzeugmaschinenfabrik Adolf Waldrich Coburg. Device for ending the feed movement of a grinding wheel. 3,978,624, Cl. 51-165.920.
Mersereau, Emory P.: *See—*
Trifunovic, Alexander L.; Hills, William H.; Borgman, Milton H.; and Mersereau, Emory P., 3,978,561.
Merten, Rudolf: *See—*
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Mertl, Ivan: *See—*
Cuneo, Joseph J.; and Mertl, Ivan, 3,978,808.
Metal Buildings Insulation, Inc.: *See—*
Bondra, John, Jr.; and Ruhling, William R., 3,979,245.
Metallgesellschaft Aktiengesellschaft: *See—*
Pockrandt, Gunther, 3,979,328.
Metcalfe, Trevor Hatfield; Scott, Geoffrey; Thompson, Paul Michael; and Wilford, Ernest, to Associated Weavers Limited. Carpet printing apparatus. 3,978,692, Cl. 68-5.00D.
Meto-Plast Corporation: *See—*
Maruniak, Adam, 3,978,605.
Meyer, Gerhard; Magerlein, Helmut; and Rupp, Hans-Dieter, to Akzona Incorporated. Process for the production of thiophosgene. 3,979,451, Cl. 260-543.00H.
Mezey, Sandor, to Egyesult Izzolampa ES Villamossagi RT. Apparatus for arranging, separating and positioning of items being conveyed. 3,978,979, Cl. 198-394.000.
Michel, Walter A. Heart beat waveform monitoring apparatus. 3,978,856, Cl. 128-2.06A.
Michelbrink, Bernhard; and Goeke, Manfred, to Babcock & Wilcox Limited. Apparatus for independent adjustment of the tension of conveyor chains. 3,978,977, Cl. 198-816.000.
Microbyx Corporation: *See—*
Bucalo, Louis, 3,979,263.
Middelhoek, Servaas; and Baan, Diederich J., to Billiton Research B.V. Process for the preparation of magnesium. 3,979,206, Cl. 75-67.00R.
Middlestead, Richard W.: *See—*
Motley, David M.; Cheng, King Y.; and Middlestead, Richard W., 3,979,685.
Mielke, Lloyd N., to United States of America, Agriculture. Apparatus and method for obtaining undisturbed soil core samples. 3,978,932, Cl. 175-249.000.
Mihos, Harry N. Bee feeder. 3,978,534, Cl. 6-5.000.
Milgo Electronics Corporation: *See—*
Roedel, Charles William; Borysiewicz, Richard; So, Richard Tan; and Swan, Larry Wayne, 3,979,559.
Milgrom, Jack: *See—*
Barker, George E.; Cohen, Stephen C.; O'Brien, John L.; and Milgrom, Jack, 3,978,702.
Miller, Art J.: *See—*
Clark, Gary E.; and Miller, Art J., 3,978,721.
Miller, Donald Leroy, to Facet Enterprises, Inc. Resilient connection between inner and outer poles on electromagnetic clutch. 3,978,953, Cl. 192-84.00C.
Miller, Ray A.; Dillinger, Robert B.; Stone, W. James; and Burklund, Vernon D., to United States of America, Navy. Vertical sensing and control system. 3,979,089, Cl. 244-122.0AD.
Miller, Roy W.; and Varda, Eugene L., to Pullman Incorporated. Door tripping device for railway hopper car. 3,978,997, Cl. 214-63.000.
Miller, Samuel, Jr. Spring clip fastened panel and frame assembly. 3,978,554, Cl. 24-73.00B.
Milliot, Henri: *See—*
Arnaud, Henri; Hublin, Martial; Devaux, Georges; Lambert, Claude; and Milliot, Henri, 3,978,834.
Mills, Justin W., Jr., to Lif-O-Gen, Inc. Demand regulator. 3,978,854, Cl. 128-142.200.
Mills, Loring K., to Polaroid Corporation. Circuit board arrangement for collapsible camera apparatus. 3,979,763, Cl. 354-187.000.
Mims, James H., to Westinghouse Electric Corporation. Discrete analog processing system including a matrix of memory elements. 3,979,582, Cl. 235-193.000.
Minnesota Mining and Manufacturing Company: *See—*
Anderson, Raymond H.; and Wu, Ning, 3,979,160.
Endres, Leland S., 3,979,463.
Mino, Junryo: *See—*
Arai, Haruhiko; and Mino, Junryo, 3,979,306.
Misurek, Chester: *See—*
Orlando, Daniel; and Misurek, Chester, 3,978,571.
Mitchell, William Leroy; and Yee, John W. Periscope rear view helmet and helmet adapter. 3,978,526, Cl. 2-422.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Ito, Toshio; Hibino, Masahiro; and Kohya, Tetsuya, 3,979,572.

Nakata, Josuke; and Denda, Ryuji, 3,979,767.

Mitsubishi Rayon Co., Ltd.: *See—*
Kosaka, Kenzo; Horikawa, Toshio; Uchida, Minoru; Morioka, Shin; Shibata, Kunio; and Takahashi, Eizi, 3,978,647.

Mitsui Mining & Smelting Co., Ltd.: *See—*
Miyazaki, Kazuhide; and Abe, Kiyomi, 3,979,337.

Mitsui Toatsu Chemicals, Incorporated: *See—*
Eguchi, Tomoki; Akitsune, Kenji; Unoki, Michio; Kataoka, Jinichi; Kato, Toshiki; and Hiai, Atsuhiko, 3,979,392.

Miura, Yoshihiko, to Yuko Shindosho Company Limited. Method of making a pin plug. 3,978,581, Cl. 29-630.00A.

Miyamae, Toshiaki. Motorized fishing reel. 3,979,081, Cl. 242-84.10A.

Miyamoto, Akira: *See—*
Yamashita, Makoto; Kushida, Masagoro; Niitsuma, Fumio; Enomoto, Masao; and Miyamoto, Akira, 3,979,158.

Miyao, Takayuki; Maeda, Hiroaki; and Sato, Masanori, to Aisin Seiki Kabushiki Kaisha. Piston shoe for fluid pressure pump motor. 3,978,772, Cl. 92-158.000.

Miyazaki, Isamu: *See—*
Inagawa, Mitsugu; and Miyazaki, Isamu, 3,978,893.

Miyazaki, Kazuhide; and Abe, Kiyomi, to Mitsui Mining & Smelting Co., Ltd. Catalyst for reducing nitrogen oxides. 3,979,337, Cl. 252-466.00J.

Miyazawa, Yoshihide: *See—*
Ozutsumi, Minoru; Ohnishi, Yoshitake; Miyazawa, Yoshihide; and Gonda, Michihiro, 3,979,320.

Miyoshi, Kunihiko: *See—*
Kagiya, Tsutomu; Miyoshi, Kunihiko; and Takemoto, Katsuo, 3,979,482.

Mizuma, Katsuhisa, to Neturen Company Ltd. Steel rod for prestressing concrete. 3,979,186, Cl. 29-183.500.

Mizutani, Hiroshi: *See—*
Ito, Shyogo; and Mizutani, Hiroshi, 3,978,696.

Mobil Oil Corporation: *See—*
Butter, Stephen A., 3,979,472.
Sether, Walter H., 3,978,638.
Theissen, Robert J., 3,979,437.
Yan, Tsoung-Yuan, 3,979,279.
Zemanek, Joseph, Jr., 3,979,714.

Mochizuki, Mitsuo. Door closer hinge. 3,978,551, Cl. 16-189.000.

Mock, C. Howard: *See—*
Disparte, Charles P.; Hall, Warren L., Jr.; Isaac, Kenneth N.; and Mock, C. Howard, 3,979,725.

Modersohn, Charles W., to Warner Electric Brake & Clutch Company. Clutch brake unit. 3,978,947, Cl. 192-12.0BA.

Modiano, Guido. Apparatus for separating bundled bars. 3,979,018, Cl. 221-10.000.

Moehlenpah, Walter G. Apparatus for fabricating wood structures. 3,978,783, Cl. 100-53.000.

Moffett, Walter K., to Du Pont de Nemours, E. I., and Company. Ionomer resin substrates coated with an epoxy primer and finished with an acrylic coating. 3,979,540, Cl. 428-159.000.

Molins Limited: *See—*
Williams, Robert Ernest; and Marritt, Clifford Russell, 3,978,969.

Molitor, Edwin A.: *See—*
Lloyd, Allen H.; Molitor, Edwin A.; Honnert, Quentin E.; Porter, Ronald H.; and Crowe, Norman P., 3,978,973.
Stapp, Willis J.; Crowe, Norman P.; and Molitor, Edwin A., 3,978,785.

Monde, Hirao: *See—*
Ohashi, Katsuaki; and Monde, Hirao, 3,979,079.

Monnet, Bernard Leon, to Billion S.A. Apparatus for injection molding articles composed of a material in which are embedded masses of one or more other materials. 3,979,170, Cl. 425-130.000.

Monroe Belgium N.V.: *See—*
Keijzer, Johan H.; and Maes, Gery O., 3,979,134.
van den Berg, Johan H.; van Eekelen, Alex H.; and Hoebrechts, Albert G., 3,978,544.
van Eekelen, Alex H. A. M.; Hoebrechts, Albert J. G.; and van den Berg, Johan H., 3,978,542.

Monsanto Company: *See—*
Alt, Gerhard H., 3,979,200.
Bloomfield, Jordan J., 3,979,201.
Herber, John F., 3,979,324.
Herber, John F., 3,979,327.
Olin, John F.; and Hamm, Philip C., 3,979,202.
Schumacher, Ignatius, 3,979,467.
Trivette, Chester Draper, Jr., 3,979,369.
Walsh, Robert J., 3,979,239.

Monsanto Research Corporation: *See—*
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Montedison S.p.A.: *See—*
Montiglio, Ugo; Basile, Giampiero; Aspes, Pierfrancesco; and Gallinotti, Elio, 3,979,310.

Montemarano, Jean A.: *See—*
Dyckman, Edward J.; Montemarano, Jean A.; Fischer, Eugene C.; and Ressler, Robert R., 3,979,354.

Montiglio, Ugo; Basile, Giampiero; Aspes, Pierfrancesco; and Gallinotti, Elio, to Montedison S.p.A. Process for preparing ferromagnetic chromium dioxide. 3,979,310, Cl. 252-62.510.

Mooradian, Aram: *See—*
Alexander, Ernest John; and Mooradian, Aram, 3,979,391.

Moore Business Forms, Inc.: *See—*
Alsop, Derek J., 3,979,141.

Moore, Thomas W., to AMF Incorporated. Start-up circuit for static inverter. 3,979,660, Cl. 321-11.000.

Moore, William C.; and Newman, Richard W., to Welch Allyn, Inc. Medical diagnostic instruments. 3,978,850, Cl. 128-9.000.

Moore, William Thomas, to Rank Organisation Limited, The. Displays. 3,979,743, Cl. 340-324.00R.

Morbark Industries, Inc.: *See—*
Morey, Norval K.; and Smith, Leward N., 3,979,152.

Morcom, William R.; and Sanders, Thomas J., to Harris Corporation. Device isolation in integrated circuits. 3,979,237, Cl. 156-3.000.

Moreau, Jerry P.; Chance, Leon H.; Boudreaux, Gordon J.; and Drake, George L., Jr., to United States of America, Agriculture. α,α'-Bis-(phosphono)dicarboxylic acid derivatives. 3,979,533, Cl. 427-390.000.

Morel, Jean Alexandre. Sweeping and lifting device for gathering cut grass and the like. 3,978,545, Cl. 15-83.000.

Morey, Norval K.; and Smith, Leward N., to Morbark Industries, Inc. Particulate material handling apparatus. 3,979,152, Cl. 302-17.000.

Mori, Koshiro: *See—*
Fukai, Masakazu; Asai, Komei; Nagata, Seiichi; Tatsuta, Hiroshi; and Mori, Koshiro, 3,979,319.

Morin, John O.: *See—*
Beling, Thomas E.; Morin, John O.; and Yanikoski, Florian F., 3,978,690.

Morioka, Shin: *See—*
Kosaka, Kenzo; Horikawa, Toshio; Uchida, Minoru; Morioka, Shin; Shibata, Kunio; and Takahashi, Eizi, 3,978,647.

Morishita, Yasomatsu, to Ryobi, Ltd. Fishing spinning-reel spool mounting and demounting device. 3,979,082, Cl. 242-84.20R.

Morokawa, Shigeru: *See—*
Hashimoto, Yukio; and Morokawa, Shigeru, 3,978,650.
Sekiya, Fukuo; and Morokawa, Shigeru, 3,979,608.

Morozowich, Walter, to Upjohn Company, The. Phenacyl-type esters of phenyl-substituted PGE-type compounds. 3,979,440, Cl. 260-473.00A.

Morris, William E., to Spec-Co Industries, Inc. Foldable trailer. 3,979,133, Cl. 280-42.000.

Morrison, David W.: *See—*
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Morrison Machine Co.: *See—*
Marino, Thomas; Kreefft, John; and Stanislaw, Peter, 3,978,787.

Morrison, Marshal, to Stryker Corporation. Surgical cutting device. 3,978,862, Cl. 128-317.000.

Morrison Medical Products Company: *See—*
Morrison, Robert D., 3,978,853.

Morrison, Robert D., to Morrison Medical Products Company. Ankle hitch. 3,978,853, Cl. 128-84.00R.

Morrissey, Jack D.; and Frank, Robert G., to PPG Industries, Inc. Conveying glass sheets of different curvatures. 3,978,974, Cl 198-782.000.

Morrow, Edward Lucas; and Colatosti, Peter Edward, to Olin Corporation. Shell deflector-catcher. 3,978,602, Cl. 42-1.00T.

Mory, Rudolf: *See—*
von der Crone, Jost; Pugin, Andre; and Mory, Rudolf, 3,979,386.

Moskovenko, Igor Borisovich: *See—*
Glagovsky, Boris Aronovich; Kamenkovich, Anatoly Samoilovich; Lysanov, Vladislav Sergeevich; Moskovenko, Igor Borisovich; Roitshtein, Garri Shmilevich; Slavina, Ljudmila Yakovlevna; Feldgun, Leon Izrailevich; Frenkel, Larisa Ruvimovna; Khait, Alexandr Lazarevich; Shashkina, Galina Alexandrovna; Yashin, Veniamin Alexandrovich; Kremen, Zinovy Illich; and Muzykant, Yakov Abramovich, 3,978,711.

Moskovich, Jury Leonidovich; Juriev, Jury Nikolaevich; Tsyskovsky, Viktor Karlovich; Berezova, Ljudmila Vasilievna; Gilchenok, Nokhum Davidovich; Yanshevsky, Vladimir Avgustovich; Mushenko, Dmitry Vasilievich; Zelikman, Evgeny Semenovich; Filippova, Rufina Alexandrovna; Klimenko, Vladimir Leonidovich; and Sobolev, Valerian Mikhailovich. Method for preparing dicarboxylic acids. 3,979,450, Cl. 260-537.00P.

Motley, David M.; Cheng, King Y.; and Middlestead, Richard W., to Hycom Incorporated. Frequency shift key demodulator. 3,979,685, Cl. 329-105.000.

Motorola, Inc.: *See—*
Bennett, Thomas H.; Carlow, Earl F.; and Wiles, Michael F., 3,979,730.
Hepworth, Edward C.; and Means, Rodney J., 3,979,732.

Mouranie, Edward M., to Westward Company, The. Gas line pierce valve. 3,978,881, Cl. 137-318.000.

MPL, Inc.: *See—*
Tischlinger, Edward A., 3,978,858.

Muck, Eduard; Horak, Josef; Strachota, Jaroslav, deceased (by Strachotova, Vera, legal representative); Boleslav, Jiri; Grygera, Lubomir; Bogdanovicz, Ladislav; and Hvezda, Otto, to Statni vyzkumny ustav kozedelny. Process for the manufacture of artificial leather and product made thereby. 3,979,532, Cl. 427-245.000.

Mudge, John L.; Zimmer, Jerry W.; and Taft, Keith G., to Raytheon Company. V-groove isolated integrated circuit memory with integral pinched resistors. 3,979,612, Cl. 307-303.000.

Mueller, John L.; and Reichert, Henry M., to Sparton Corporation. Tubeless tire bead seater. 3,978,903, Cl. 157-1.200.

Mueller, Wolfgang Peter: *See—*
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Muellner, James M., to Smarte Carte, Inc. Dispensing system for wheeled vehicles. 3,978,959, Cl. 194-4.00R.

Muenchinger, Herman M., to Research Engineering & Manufacturing, Inc. Self-thread forming threaded fasteners and blanks for making same. 3,978,760, Cl. 85-47.000.

Muller, Francois: *See—*
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Multifold-International, Inc.: *See—*
Lloyd, Allen H.; Molitor, Edwin A.; Honnert, Quentin E.; Porter, Ronald H.; and Crowe, Norman P., 3,978,973.
Stapp, Willis J.; Crowe, Norman P.; and Molitor, Edwin A., 3,978,785.

Mulzet, Alfred Paul; and Sirico, James Louis, to International Business Machines Corporation. Positioning apparatus. 3,978,992, Cl. 214-1.0BB.

Munn, Robert; and Tiso, Albert, to George Hantscho Company, Inc. Sheet stacking and interleaving apparatus. 3,979,112, Cl. 270-58.000.

Munzner, Heinrich; Heimbach, Heinrich; Korbacher, Werner; Peters, Werner; Juntgen, Harald; Knoblauch, Karl; and Zundorf, Dieter, to Bergwerksverband GmbH. Carbon containing molecular sieves. 3,979,330, Cl. 252-445.000.

Murabito, Frank. Safety for revolvers. 3,978,603, Cl. 42-66.000.

Murakami, Noboru, to Aisin Seiki Kabushiki Kaisha. Fluid pressure control system for automatic transmission. 3,978,743, Cl. 74-869.000.

Murakami, Takanobu: *See—*
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Muramoto, Shoichi: *See—*
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Murphy, Joseph P., to Avco Corporation. Gas turbine engine air inlets having particle separators. 3,978,656, Cl. 60-39.09P.

Mushenko, Dmitry Vasilievich: *See—*
Moskovich, Jury Leonidovich; Juriev, Jury Nikolaevich; Tsyskovsky, Viktor Karlovich; Berezova, Ljudmila Vasilievna; Gilchenok, Nokhum Davidovich; Yanshevsky, Vladimir Avgustovich; Mushenko, Dmitry Vasilievich; Zelikman, Evgeny Semenovich; Filippova, Rufina Alexandrovna; Klimenko, Vladimir Leonidovich; and Sobolev, Valerian Mikhailovich, 3,979,450.

Musick, Charles Ronald: *See—*
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Musick, Francis S. Lighted cigar holder. 3,978,981, Cl. 206-276.000.

Mustoe, Jack, Jr., to Glentore Timber Products Limited. Nail extractor. 3,978,576, Cl. 254-18.000.

Muzykant, Yakov Abramovich: *See—*
Glagovsky, Boris Aronovich; Kamenkovich, Anatoly Samoilovich; Lysanov, Vladislav Sergeevich; Moskovenko, Igor Borisovich; Roitshtein, Garri Shmilevich; Slavina, Ljudmila Yakovlevna; Feldgun, Leon Izrailevich; Frenkel, Larisa Ruvimovna; Khait, Alexandr Lazarevich; Shashkina, Galina Alexandrovna; Yashin, Veniamin Alexandrovich; Kremen, Zinovy Illich; and Muzykant, Yakov Abramovich, 3,978,711.

Myers Industries, Inc.: *See—*
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Myers, John W., to Phillips Petroleum Company. Activating group VIII metal/alumina catalysts with hydrogen halide/halosilane/organic halide. 3,979,333, Cl. 252-441.000.

N. C. Ashton Limited: *See—*
Ashton, Norman Coupe, 3,979,208.

Nagano, Tamio. Axially and radially rigid support plate for diaphragm clutch. 3,978,955, Cl. 192-89.00B.

Nagasaki, Katsumi; Seto, Yoshito; and Yamasaki, Hiroyuki, to Kubota, Ltd. Method and apparatus for removing slag. 3,979,108, Cl. 266-201.000.

Nagashima, Shunzaburo: *See—*
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Nagata, Seiichi: *See—*
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Nagatomo, Katuaki; Fukumori, Hiromasa; and Narikiyo, Hiroyuki, to Hitachi, Ltd. Heating and cooling device for an agitator tank serving as a fermentor. 3,978,918, Cl. 165-109.000.

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Nakagawa, Yunosuke; Sugiura, Shigetsugu; Matsunaga, Kinjiro; and Ito, Yoshio, to Kao Soap Co., Ltd.; and Nippon Peroxide Co., Ltd. Detergent composition containing novel bleaching agent. 3,979,312, Cl. 252-99.000.

Nakagawa, Yunosuke; Sugiura, Shigetsugu; Matsunaga, Kinjiro; and Ito, Yoshio, to Kao Soap Co., Ltd.; and Nippon Peroxide Co., Ltd. Bleaching composition. 3,979,313, Cl. 252-99.000.

Nakamura, Katsuya: *See—*
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Nakamura, Masashi: *See—*
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Nakao, Masaru: *See—*
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Nakao, Yoshio; Kitano, Kazuaki; Kintaka, Kazuhiko; Suzuki, Shigeru; Katamoto, Kazuyoshi; and Nara, Kiyoshi, to Takeda Chemical Industries, Ltd. Production of deacetoxycephalosporin C. 3,979,260, Cl. 195-36.00C.

Nakashima, Akio: *See—*
Arakawa, Yoshihiro; Nakashima, Akio; Iwabuchi, Shunji; and Ando, Kenji, 3,979,641.

Nakasugi, Hajime: *See—*
Gondo, Hisashi; Nakayama, Masatoki; Nakasugi, Hajime; and Yamaguchi, Masanobu, 3,979,231.

Nakata, Josuke; and Denda, Ryuji, to Mitsubishi Denki Kabushiki Kaisha. Multilayer P-N junction semiconductor switching device having a low resistance path across said P-N junction. 3,979,767, Cl. 357-38.000.

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Nakayama, Masatoki: *See—*
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Nalco Chemical Company: *See—*
Ballweber, Edward G.; and Phillips, Kenneth G., 3,979,348.

Naono, Toyohiko, to Nihon Denshi Kabushiki Kaisha. Rotary measuring valve. 3,978,888, Cl. 137-625.190.

Naplatanov, Nicolay Delchev; Sgurov, Vasil Stoyanov; Petrov, Peter Anguelov; Nicolov, Zdravko Alexandrov; Ganchev, Alexander Ivanov; and Trendafilov, Stefan Petrov, to Institute Po Technicheska Kibernetika pri Ban. Method of and system for rationalizing the operation of open-pit mines. 3,979,731, Cl. 340-172.500.

Nara, Kiyoshi: *See—*
Nakao, Yoshio; Kitano, Kazuaki; Kintaka, Kazuhiko; Suzuki, Shigeru; Katamoto, Kazuyoshi; and Nara, Kiyoshi, 3,979,260.

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Narikiyo, Hiroyuki: *See—*
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Nash, Dudley O., to General Electric Company. Actuating means for a thrust vectoring gas turbine engine exhaust nozzle. 3,979,067, Cl. 239-265.350.

National Distillers and Chemical Corporation: *See—*
Braus, Harry; and Woltermann, Jay R., 3,979,545.
Lorand, George E., 3,979,180.

National Machinery Company, The: *See—*
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National Marine Service, Inc.: *See—*
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National Pride Equipment, Inc.: *See—*
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National-Standard Company: *See—*
Bennett, George H.; and Pringle, Wilbur L., 3,978,645.

Naulin, Michel, to La Telemecanique Electrique. Toggle manipulator. 3,978,738, Cl. 74-471.0XY.

Nazarov, Boris Vladimirovich: *See—*
Sudnishnikov, Boris Vasilievich; Kamensky, Veniamin Viktorovich; Varnello, Eduard Petrovich; Tupitsin, Sergei Konstantinovich; and Nazarov, Boris Vladimirovich, 3,978,931.

Ned Strongin Associates, Inc.: *See—*
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Nederlande Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid Handle En Verkeer: *See—*
Selling, Hendrak Johannes; Van Lingen, Hendrik; and Han, Njo Hong, 3,979,177.

Neff, Nelson Edward, to AMP Incorporated. Field assembly for electric motors. 3,979,615, Cl. 310-71.000.

Nelson, Peter H.; Untch, Karl G.; and Dunn, James P., to Syntex (U.S.A.) Inc. Solvolytic process for the preparation of 2-(5H-dibenzo[a,d]cyclohepten-5-on-2-yl)acetic, propionic and butyric acids. 3,979,430, Cl. 260-465.00K.

Nett, Louis A. Ventilating apparatus. 3,978,777, Cl. 98-115.00K.

Neturen Company Ltd.: *See—*
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Neumann, Jurgen: *See—*
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Neville, James J.; Ferrell, Wesley; and Shichman, Daniel, to Uniroyal Inc. Zero degree belted tires, and high "soft stretch" belt-forming tapes therefor. 3,979,536, Cl. 428-43.000.

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Newberry, Robert Anthony; and Bushell, Brian John, to John Wyeth & Brother. Thiazole derivatives. 3,979,402, Cl. 260-302.00R.

Newell Companies, Inc.: *See—*
Riebock, William D.; and Graves, Delbert B., 3,978,904.

Newman, David P., to Yellow Springs Instrument Company, Inc., The. Membrane for enzyme electrodes. 3,979,274, Cl. 204-195.00B.

Newman, Richard W.: *See—*
Moore, William C.; and Newman, Richard W., 3,978,850.

Newton, Derek Alan, to Dunlop Limited. Energy absorbers. 3,979,110, Cl. 267-140.000.

Newton, Michael Charles: *See—*
Hayward, Martin Henry; and Newton, Michael Charles, 3,978,613.

Ngo, Peter Dinh-Tuan, to Bell Telephone Laboratories, Incorporated. Plasma panel with dynamic keep-alive operation. 3,979,638, Cl. 315-169.0TV.

Nicholls, Ernest George; and Allitt, Bernard Charles, to Dunlop Limited. Tire building apparatus. 3,979,249, Cl. 156-416.000.

Nick, Howard H.: *See—*
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Nicolov, Zdravko Alexandrov: *See—*
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Nihon Denshi Kabushiki Kaisha: *See—*
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Niitsuma, Fumio: *See—*
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Nippon Electric Company, Ltd.: *See—*
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Nippon Gakki Seizo Kabushiki Kaisha: *See—*
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Nippon Kokan Kabushiki Kaisha: *See—*
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Nippon Peroxide Co., Ltd.: *See—*
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Nishibata, Shiyuji; Hirose, Kazumasa; Harada, Kunihara; and Fukumori, Tokuro, to Japan Synthetic Rubber Co., Ltd. Heat resistant rubbery polymer composition. 3,979,358, Cl. 260-45.75N.

Nishida, Sumio: *See—*
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Takahashi, Koichi; and Hitomi, Nobuteru, 3,978,829.

Nitzki, Leopold, to Aktiengesellschaft "Weser". Offshore station and method of maintaining the same. 3,978,807, Cl. 114-.50D.

NL Industries, Inc.: *See—*
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Noguchi, Masaaki; and Sumiyoshi, Masaharu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Suction heat control unit in internal combustion engine. 3,978,836, Cl. 123-122.00G.

Nohmi Bosai Kogyo Co., Ltd.: *See—*
Toyoshima, Shigeru; Honda, Mamoru; Nakamura, Katsuya; and Seki, Katsuhisa, 3,979,648.

Nonnenmacher, Gerhard, to Robert Bosch G.m.b.H. Hydraulic transmission with input-output speed ratio regulation. 3,978,668, Cl. 60-447.000.

Nordentoft, Lars, to ITT Industries, Inc. Shower head. 3,979,064, Cl. 239-107.000.

Noreika, Alexander J.; and Francombe, Maurice H., to Westinghouse Electric Corporation. Deposition of solid semiconductor compositions and novel semiconductor materials. 3,979,271, Cl. 204-192.000.

Norris Industries, Inc.: *See—*
Weeks, Charles B.; and Choate, Paul V., 3,979,008.

North, Charles J.: *See—*
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North States Industries, Inc.: *See—*
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Northcutt, Walter G., Jr.; and Snyder, William B., Jr., to United States of America, Energy Research and Development Administration. Process for fabricating articles of tungsten-nickel-iron alloy. 3,979,234, Cl. 148-126.000.

Norton Company: *See—*
Trostel, Louis J., Jr., 3,979,214.

Nosanov, Valentin Alexandrovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Boiko, Georgy Alexandrovich; Kumysh, Ilya Iosifovich; Puzrin, Leonid Gustavovich; Kovalev, Viktor Alexandrovich; Marinsky, Georgy Sergeevich; Beloglazov, Alexandr Petrovich; Siry, Pavel Osipovich; Sopozhnikov, Alexandr Ivanovich; Nosanov, Valentin Alexandrovich; Babinovich, Volf Iudovich; Popov, Lev Vasilievich; Shelkov, Sergei Mikhailovich; Strukov, Vladimir Nikolaevich; and Babich, Boris Markovich, 3,979,101.

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Novak, Richard Charles; and Pike, Roscoe Adams, to United Technologies Corporation. Resin bonded composite articles and process for fabrication thereof. 3,979,244, Cl. 156-179.000.

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Obi, Mikio: *See—*
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Ohara, Naoki, to Aisin Seiki Kabushiki Kaisha. Hydraulic brake booster. 3,978,667, Cl. 60-403.000.

Ohashi, Katsuaki; and Monde, Hirao, to Asahi Kogaku Kogyo Kabushiki Kaisha. Roll film winding mechanism. 3,979,079, Cl. 242-75.200.

Ohgoshi, Akio: *See—*
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Ohnishi, Yoshitake: *See—*
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Oister, George K. D-C power supply and ignition system. 3,978,838, Cl. 123-148.0CA.

Okada, Hiroshi: *See—*
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Okamoto, Shouichi, to Citizen Watch Co., Ltd. Numerically controlled automatic lathe. 3,978,745, Cl. 82-2.00B.

Olin Corporation: *See—*
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Morrow, Edward Lucas; and Colatosti, Peter Edward, 3,978,602.
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Pivawer, Philip M.; and Farmer, Douglas A., Jr., 3,979,403.

Olin, John F.; and Hamm, Philip C., to Monsanto Company. Metabifunctional benzenes and herbicidal compositions. 3,979,202, Cl. 71-98.000.

Olinkraft, Inc.: *See—*
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Oliver, Gene L.: *See—*
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Epina, August P.; Olmsted, Dennis R.; Platter, Sanford; Jones, Robert J.; and Marion, Jack L., 3,978,546.

Olson, Wallace Fred; and McNeal, James Clifton, to Smith International, Inc. Bit-adjacent stabilizer and steel. 3,978,933, Cl. 175-325.000.

Oltrogge, Victor Conrad. Tailgate unloader. 3,978,996, Cl. 214-17.00D.
O'Meara, Thomas R., to Hughes Aircraft Company. Adaptive imaging telescope with camera-computer transform image quality sensing and electro-optic phase shifting. 3,979,585, Cl. 250-201.000.
OMEGA Louis Brandt & Frere S.A.: *See—*
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Parker, Robert W.; and Ooms, Bertus, 3,978,664.
Oosterling, Pieter Adriaan; and Hooftman, Johannes Phillippus, to H. Vissers B.V. Device for spreading distributable material comprising a reciprocatorily swinging pipe-shaped distributor. 3,979,072, Cl. 239-689.000.
Opittek, Eugene W.; Ketcham, David J.; and Dragavon, Edward J., to Hughes Aircraft Company. Histogram equalization system for display improvement. 3,979,555, Cl. 178-6.800.
Oriani, Gianni: *See—*
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Orlando, Daniel; and Misurek, Chester, to Globe-Union Inc. Apparatus for assembling storage battery plates and separators. 3,978,571, Cl. 29-204.00R.
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Beelitz, Howard Raymond; and Preslar, Donald Ray, 3,979,607.
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Schade, Otto Heinrich, Jr., 3,979,689.
Van Ormer, David Dale, 3,979,630.
Ream, Michael D., to Caterpillar Tractor Co. Parking brake system with transmission interlock. 3,978,946, Cl. 192-4.00A.
Rebentisch, Hans W.; and Steinmeyer, Gerhard W., to USM Corporation. Electrostatic application of thermoplastic adhesive. 3,979,529, Cl. 427-25.000.
Reddaway, Stewart Fiddian, to International Computers Limited. Array processors. 3,979,728, Cl. 340-172.500.
Redford, David A., to Texaco Exploration Canada Ltd. Method for recovery of bitumens from tar sands. 3,978,925, Cl. 166-261.000.
Reed International Limited: *See*—
Graham, Thomas; Foley, Michael James Yates; and Reid, David, 3,979,343.
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Regie Nationale des Usines Renault: *See*—
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Reimers, James L., to FMC Corporation. Loader for containerized cooker. 3,978,970, Cl. 198-425.000.
Reinecke, Gunter, to Benz & Hilgers GmbH. System for dosing a viscous hardenable mass into a succession of containers. 3,979,021, Cl. 222-1.000.
Reinhardt, Robert M.; and Kullman, Russell M. H., to United States of America, Agriculture. Finishing of cellulose fabrics with N-methylol amide crosslinking agents, magnesium sulfate and sulfuric acid. 3,979,178, Cl. 8-185.000.
Renner, Theodor; Falkenberg, Dieter; Rittmayer, Gerhard; and Grubmuller, Georg, to Siemens Aktiengesellschaft. Thermal generator with parallel circuits. 3,979,226, Cl. 136-208.000.
Repay, Laszlo N.; Young, Thomas A.; and Amberik, Andrew A., to Tenna Corporation. Electrically adjustable vehicle accessory. 3,978,735, Cl. 74-89.150.
Resch, Reinhard: *See*—
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Research Corporation: *See*—
Kjelgaard, William L.; and Anderson, Paul M., 3,978,681.
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Reuland, Joachim, to Hauni-Werke Korber & Co., KG. Method and arrangement for determining the mass of tobacco or the like by capacitance and attenuation measurements in a resonant high frequency oscillator circuit. 3,979,581, Cl. 235-151.330.

Reuschel, Konrad: *See—*
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Reynolds Metals Company: *See—*
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Rhoades, Vaughan W.: *See—*
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Rhodes, Charles W., to Burden, Alfred L., a part interest. Power roll mill guarding device. 3,978,701, Cl. 72-2.000.

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Rice, Dale E. Decoder. 3,979,562, Cl. 179-84.0VF.

Richardson, Robert L.; and Johnston, Norris. Magnetic wire line marking, erasing and detecting method and apparatus. 3,978,588, Cl. 33-126.500.

Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
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Riebock, William D.; and Graves, Delbert B., to Newell Companies, Inc. Knotless master carrier. 3,978,904, Cl. 160-345.000.

Riedl, Kurt, to Biochemie Gesellschaft m.b.H. 14-Desoxy-14-tosyloxyacetoxy-mutilin. 3,979,423, Cl. 260-456.00P.

Rieger, William H.; and Crowe, Ernest W., to Reilly Tar & Chemical Corporation. Production of pyridyl ketones. 3,979,400, Cl. 260-297.00R.

Riggs, Ray Vere: *See—*
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Riggs, Royal W. Fishhook and worm lure combination. 3,978,606, Cl. 43-42.240.

Rijnders, Johannes; and Iedema, Harry William Jelle, to U.S. Philips Corporation. Headlight and incandescent lamp for anti-dazzle beam. 3,979,622, Cl. 313-117.000.

Rindelaub, Frank A. E.: *See—*
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Ringelhaan, Otmar E., to Siemens Aktiengesellschaft. Line amplifier. 3,979,687, Cl. 330-17.000.

Ringkamp, Joseph D., to Acker Drill Company, Inc. Transfer feed system. 3,978,768, Cl. 91-189.00R.

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Timtner, Karlheinz, 3,978,950.

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Roberts, Melvin F., to Bloomfield Industries, Inc. Water system deliming apparatus. 3,979,221, Cl. 134-99.000.

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Roccaforte, Harry I., to Hoerner Waldorf Corporation. Carton. 3,978,980, Cl. 206-45.140.

Rockwell International Corporation: *See—*
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Pool, Eldert B.; and Schweitzer, Raymond L., 3,979,105.
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Rodgers, Aubrey; and Widner, Rayburn K., to United States of America, Army. Electrofluid converter. 3,979,102, Cl. 251-11.000.

Rodriquez, Rodolfo R.: *See—*
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Roedel, Charles William; Borysiewicz, Richard; So, Richard Tan; and Swan, Larry Wayne, to Milgo Electronics Corporation. Data modem having line verification and automatic disconnect features. 3,979,559, Cl. 179-2.0DP.

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Roget, Jean: *See—*
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Rohde, David F.: *See—*
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Rose, Bernard R.; Meggs, Daniel H.; and Beny, Janos. Apparatus for simulating an open fire. 3,978,598, Cl. 40-106.520.

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Rosenkranz, Hans Jurgen: *See—*
Perrey, Hermann; Welz, Harry; Lange, Ralf; Rudolph, Hans; and Rosenkranz, Hans Jurgen, 3,979,454.

Rosenthal, Myron M.: *See—*
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Ross, Gerald F.; and Robbins, Kenneth W., to Sperry Rand Corporation. Range readout apparatus. 3,979,749, Cl. 343-13.00R.

Ross, Lawrence James, to American Cyanamid Company. Process for producing amino G acid and amino J acid from tobias acid. 3,979,445, Cl. 260-508.000.

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Rossell, Edgar Ronald: *See—*
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Rostone Corporation: *See—*
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Rothe, Werner; Heinemann, Helmut; Schmidt, Felix Helmut; and Betzien, Gunter, to Boehringer Mannheim G.m.b.H. Preparation of rapidly resorbable glibenclamide. 3,979,520, Cl. 424-321.000.

Roubeau, Pierre: *See—*
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Roussel-UCLAF: *See—*
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Rovnyak, George C., to E. R. Squibb & Sons, Inc. Thiopyrano[4,3-c] pyrazoles. 3,979,381, Cl. 260-240.00A.

Rowe International Inc.: *See—*
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Rowton, Richard Lee, to Jefferson Chemical Company, Inc. Polyurethane elastomers having improved sag resistance. 3,979,364, Cl. 260-77.5AM.

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Rudnitsky, Jury Petrovich: *See—*
Alexeev, Nikolai Efimovich; Buzhinsky, Igor Mikhailovich; Zhabotinsky, Mark Efremovich; Izyneev, Anatoly Andreevich; Koryagina, Elizaveta Ivanovna; Kravchenko, Valery Borisovich; Rudnitsky, Jury Petrovich; Gapontsev, Valentin Pavlovich; and Tsapkin, Vadim Vasilievich, 3,979,322.

Rudolph, Hans. Resilient supply and exhaust valve. 3,978,878, Cl. 137-102.000.

Rudolph, Hans: *See—*
Perrey, Hermann; Welz, Harry; Lange, Ralf; Rudolph, Hans; and Rosenkranz, Hans Jurgen, 3,979,454.

Ruhl, Robert C.; and Johnson, James E., to Chase Brass and Copper Co., Inc., by said Robert C. Ruhl. Apparatus for level winding tubing. 3,979,084, Cl. 242-158.00F.

Ruhling, William R.: *See—*
Bondra, John, Jr.; and Ruhling, William R., 3,979,245.

Ruland, Dieter, to Bayer Aktiengesellschaft. Pressure filter with continuously or intermittently movable filter cloth. 3,979,299, Cl. 210-387.000.

Rupp, Hans-Dieter: *See—*
Meyer, Gerhard; Magerlein, Helmut; and Rupp, Hans-Dieter, 3,979,451.

Rutshtein, Alexander; and Staroselsky, Naum, to Compressor Controls Corporation. Control system for controlling a dynamic compressor. 3,979,655, Cl. 318-609.000.

Ruzinsky, Sergei Ivanovich: *See—*
Golosman, Evgeny Zinovievich; Sobolevsky, Viktor Stanislavovich; Lytkin, Viktor Petrovich; Axenov, Nikolai Nikitovich; Golovkova, Alexandra Ivanovna; Peker, Yakov Anatolievich; Zinchenko, Dmitry Ivanovich; and Ruzinsky, Sergei Ivanovich, 3,979,336.

Ryan, Daniel J., to FMC Corporation. Film extrusion method. 3,979,497, Cl. 264-187.000.

Ryder, James J., to Rohr Plessey Corporation. Container discharge damage reduction flap. 3,978,999, Cl. 214-314.000.

Rynard, Richard Haig John, to Canadian General Electric Company Limited. Tank type engine heater. 3,979,574, Cl. 219-208.000.

Ryobi, Ltd.: *See—*
Morishita, Yasomatsu, 3,979,082.

S.A.E.S. Getters S.p.A.: *See—*
Zucchinelli, Mario, 3,979,166.

Saari, Veikko Reynold, to Bell Telephone Laboratories, Incorporated. Crystal-controlled oscillator having sinusoidal and square-wave output signals. 3,979,693, Cl. 331-61.000.

Saint-Gobain Industries: *See—*
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Saipem S.p.A.: *See—*
Scodino, Ambrogio, 3,978,892.

Sakaguchi, Yasuhiro; Ishii, Kiyoshi; and Kojima, Katumi, to Daicel Ltd. Method for the manufacture of fruit wines from fruit juices of low sugar content. 3,979,521, Cl. 426-15.000.

Sakamoto, Yoichi, to Matsushita Electric Industrial Co., Ltd. Channel selector. 3,979,680, Cl. 325-464.000.

Sakata, Yoshihiro: *See—*
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Sakata, Yuji: *See—*
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Sakoe, Hiroaki, to Nippon Electric Company, Ltd. Automatic character recognition device employing dynamic programming. 3,979,722, Cl. 340-146.3AE.

Sales, Edward Bernard: *See—*
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Saloom, Joseph T., to Wheatland Tube Company. U-shaped screw transfer means in immersion coating apparatus. 3,978,816, Cl. 118-426.000.

Salyer, Ival O.; and North, Charles J., to Monsanto Research Corporation. Large void-free polyethylene. 3,979,357, Cl. 260-42.460.

Samulowitz, Helmut, to U.S. Philips Corporation. Device for testing any leakage of vacuum-tight glass seals. 3,979,668, Cl. 324-71.00R.

Sandco Ltd.: *See—*
Boman, Karl Gunnar, 3,979,030.

Sandelius, John Robert, to Boeing Company, The. High altitude sonobuoy. 3,978,790, Cl. 102-4.000.

Sanders, Thomas J.: *See—*
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Sandoz Ltd.: *See—*
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Zirngibl, Ulrich, 3,979,429.

Sandoz, Roger W.; and Rosenthal, Myron M., to United States of America, Army. Rotating lens antenna seeker-head. 3,979,755, Cl. 343-754.000.

Santora, Norman Julian: *See—*
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Sanwa Machine Co., Inc.: *See—*
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Sapunov, Viktor Evgenievich: *See—*
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Sasajima, Kikuo; Ono, Keiichi; Nakao, Masaru; Maruyama, Isamu; Takayama, Masaharu; Katayama, Shigenari; Katsube, Junki; Inaba, Shigeho; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Butyrophenone derivatives and production thereof. 3,979,390, Cl. 260-268.00R.

Sasaki, Katsuyoshi: *See—*
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Sato, Masanori: *See—*
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Saunders Archery Company: *See—*
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Saunders, Charles A.; and Saunders, Thomas A., to Saunders Archery Company. Marksmanship target including pivoting target arms. 3,979,118, Cl. 273-102.10R.

Saunders, Thomas A.: *See—*
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Sausse, Andre: *See—*
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Sawazaki, Norikazu; Tsukamoto, Hiroyuki; and Yagi, Motoi, to Tokyo Shibaura Electric Co., Ltd. Magnetic recording and reproducing apparatus. 3,979,773, Cl. 360-106.000.

Sayles, David C., to United States of America, Army. Anti-erosive, solid rocket double-base propellant compositions. 3,979,236, Cl. 149-19.800.

Scaduto, John R. Internal and external cutting tool. 3,978,765, Cl. 90-24.00R.

Scanlon, William J.: *See—*
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Scanning Systems, Inc.: *See—*
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Schaar, Charles H., to Colgate-Palmolive Company. Disposable diaper with end flap means and method. 3,978,861, Cl. 128-287.000.

Schade, Otto Heinrich, Jr., to RCA Corporation. Differential amplifier circuit. 3,979,689, Cl. 330-30.00D.

Schafer, Paul; Ibrahim, Jutta; and Gysin, Hanspeter, to Ciba-Geigy Corporation. Diester-amine adducts and process for their manufacture. 3,979,442, Cl. 260-482.00P.

Schafer, Wolfgang; and Raedisch, Helmer, to Saint-Gobain Industries. Polyurethane coated safety glass. 3,979,548, Cl. 428-425.000.

Schatz, Anton: *See—*
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Scheidler, Herwig; and Kristen, Klaus, to Jenaer Glaswerk Schott & Gen. Building element. 3,978,633, Cl. 52-400.000.

Scheiner, Gloria. Crib including reflective surface. 3,978,532, Cl. 5-93.00R.

Schenk, Hanspeter; and Sigg-Grutter, Trudi, to Givaudan Corporation. Cycloaliphatic ketones, process for making same and odorant and flavoring compositions containing same. 3,979,422, Cl. 260-455.00R.

Scherer, Fridolin, to BBC Brown Boveri & Company Limited. Vacuum-tight metal-ceramic soldered joint. 3,979,187, Cl. 29-195.000.

Schillhof, Udo, to U.S. Philips Corporation. Station finder circuit for two directions. 3,979,609, Cl. 307-247.00R.

Schlaefli, George Thomas: *See—*
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Schleede, Stephen C., to A & H Engineering Corporation. Method of disposing of liquid waste. 3,978,673, Cl. 61-35.000.

Schlegel, Jurgen: *See—*
Handrick, Kurt; Benning, Anton; George, Dietrich; and Schlegel, Jurgen, 3,979,448.

Schleicher, Roger W. Auxiliary handle for a beverage can. 3,979,011, Cl. 220-94.00R.

Schleiermacher, Herbert, to Klockner-Humboldt-Deutz Aktiengesellschaft. Cylinder head with welded-on cylinder and method of making said welded unit. 3,978,840, Cl. 123-193.0CH.

Schloss, Phillip Christian: *See—*
Catron, Brittain Norman; Dumstorff, Eugene Francis; Schloss, Phillip Christian; and Schroeder, Larry Lloyd, 3,979,727.

Schlumberger Technology Corporation: *See—*
Johnson, Joseph L.; and Guidry, Shelby L., 3,978,922.
Trouiller, Jean-Claude, 3,978,939.

Schmid, Reinhold, to W. Schlafhorst & Co. Dust removing apparatus for the needles of a warp knitting machine. 3,978,691, Cl. 66-168.000.

Schmid, Rolf; Lohse, Friedrich; Fatzer, Willy; and Batzer, Hans, to Ciba-Geigy Corporation. Composition of epoxide resins, polycarboxylic acid anhydrides and polyester-dicarboxylic acids. 3,979,477, Cl. 260-835.000.

Schmidlin, Fred W.: *See—*
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Schmidt, Felix Helmut: *See—*
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Schmidt, Hartmut; Neumann, Jurgen; and Arneth, Reinhold, to Hoechst Aktiengesellschaft. Process and apparatus for separating aspherical particles from spherical particles. 3,978,986, Cl. 209-112.000.

Schmidt, Jacob, Jr.: *See—*
Schmidt, Jacob, Sr.; and Schmidt, Jacob, Jr., 3,978,874.

Schmidt, Jacob, Sr.; and Schmidt, Jacob, Jr. Heat sensitive film shrinking machine. 3,978,874, Cl. 134-107.000.

Schmit, Joseph L.: *See—*
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Schmut, Wolfgang: *See—*
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Kolbe, Joachim; Schneider, Otto; Gutschik, Ernst; and Brokmeier, Dieter, 3,979,544.

Schneidinger, Carl, to Daugherty, Jon; Sarno, Jay J.; and Schneidinger, Carl. Amusement ride power. 3,978,934, Cl. 180-2.000.

Schnell, Friedrich: *See—*
Merkel, Rudolf; Schnell, Friedrich; and Weber, Ewald, 3,978,624.

Schoffmann, Rudolf, to Allis-Chalmers Corporation. Mold with convex sidewalls for continuous casting machines. 3,978,909, Cl. 164-273.00R.

Schol, Klaas; Compen, Johannes Maria Azalina Antonius; and van den Heuvel, Reinier Maria, to U.S. Philips Corporation. Method of manufacturing an electric discharge tube having an oxide cathode. 3,978,563, Cl. 29-25.170.

Scholtz, Heinz, to Patentanwalte Dr.-Ing. Held. Suspension clamp for electrical overhead lines. 3,979,095, Cl. 248-63.000.

Schorsch, Ronald W. Electronic dynamometer. 3,978,718, Cl. 73-117.300.

Schott, Manfred: *See—*
Heitmann, Hans-Gunter; and Schott, Manfred, 3,979,288.

Schreiber, Edward T. Energy producer using dual fuels. 3,978,821, Cl. 122-5.000.

Schroder, Theodor, to Titan Verpackungs System GmbH. Closure for a steel band or strap placed around one or more articles and method and device for making said closure. 3,978,899, Cl. 140-93.200.

Schroder, Wolfgang, to International Standard Electric Corporation. Circuit arrangement for the digital control of operating functions via sensor electrodes, especially in radio and television receivers. 3,979,744, Cl. 340-324.00R.

Schroeder, Larry Lloyd: *See—*
Catron, Brittain Norman; Dumstorff, Eugene Francis; Schloss, Phillip Christian; and Schroeder, Larry Lloyd, 3,979,727.

Schroeder, Rondon L., to Continental Oil Company. Earth drilling mechanisms. 3,978,930, Cl. 175-94.000.

Schuhmann, Siegfried: *See—*
Cappel, Bert; Schuhmann, Siegfried; and Wolf, Klaus, 3,978,788.

Schukey, Jurgen. Heat engine. 3,978,680, Cl. 62-6.000.

Schuller, Walter: *See—*
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Schulman, Richard J.; and Schneider, Mark J., to International Telephone and Telegraph Corporation. Speech processor system for pitch period extraction using prediction filters. 3,979,557, Cl. 179-1.0SA.

Schulte, Harry R., to United States of America, Navy. Push plug. 3,979,013, Cl. 220-234.000.

Schultz, Everett M.; and Cragoe, Edward J., Jr., to Merck & Co., Inc. 2-Aminomethyl-6-trihalo-methylphenols. 3,979,361, Cl. 260-570.900.

Schumacher, Ignatius, to Monsanto Company. Process for the nitration of haloaromatics. 3,979,467, Cl. 260-646.000.

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Schwartz, Andrew K., Jr.; and Cooley, Stone D., to Petro-Tex Chemical Corporation. Process for the preparation of esters of maleic acid with monohydric alcohols. 3,979,443, Cl. 260-485.00R.

Schwartz, Theodore F. Bicycle drive means. 3,978,936, Cl. 180-31.000.

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Schweiger, Fritz; and Glahe, Erwin, to Hochtemperatur-Kernkraftwerke GmbH (HKG) Gemeinsames Europaisches Unternehmen. Nuclear reactor. 3,979,258, Cl. 176-86.00R.

Schweitzer, Raymond L.: *See—*
Pool, Eldert B.; and Schweitzer, Raymond L., 3,979,105.

Schwider, Alfred W.; Burnham, John; and Buritz, Robert S., to Hughes Aircraft Company. Polyester fiber-vacuum impregnated epoxy resin insulation system for high voltage transformers. 3,979,530, Cl. 427-104.000.

SCM Corporation: *See—*
Klem, Stanley J., 3,978,965.

Scodino, Ambrogio, to Saipem S.p.A. Self-locking plug apparatus for sealing and recovering a pipeline laid on a deep submerged bed. 3,978,892, Cl. 138-89.000.

Scott, Geoffrey: *See—*
Metcalfe, Trevor Hatfield; Scott, Geoffrey; Thompson, Paul Michael; and Wilford, Ernest, 3,978,692.

Scott, Henry L. Biochemical process for the synthesis of protein from cellulose and starch-containing plants. 3,979,522, Cl. 426-18.000.

Scott, Larry D.: *See—*
Tooley, John R.; Scott, Larry D.; and Chalkley, Hatcher E., 3,979,719.

Scott, M. Walter: *See—*
Hager, Robert J.; Schmit, Joseph L.; Scott, M. Walter; and Stelzer, Ernest L., 3,979,232.

Scott, Norman H., to Universal Oil Products Company. Heat exchange and flow control system for series flow reactors. 3,979,183, Cl. 23-253.00A.

Scott, Warner Curtis, to Texas Instruments Incorporated. Charged particle beam scanning device. 3,979,635, Cl. 315-12.00R.

Searle, Robert J. G.; and Woodall, Roger E., to Shell Oil Company. Pesticidal cyclopropane derivatives. 3,979,424, Cl. 260-468.00H.

Seatonberry, Brian William: *See—*
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Seay, Glenn E.: *See—*
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SEBEC Societe d'Exploitation de Brevets d'Emballage Cosmetique S.A.: *See—*
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Seidler, Helmut; Wunderlich, Klaus; Bien, Hans-Samuel; and Leister, Heinrich, to Bayer Aktiengesellschaft. Polycyclic dyestuffs. 3,979,413, Cl. 260-326.100.

Seitzer, Walter H., to Sun Ventures, Inc. Method for making hydrogen. 3,979,505, Cl. 423-657.000.

Sekhon, Jagdish S., to Hi-Shear Corporation. Protective coating material. 3,979,351, Cl. 260-32.80R.

Seki, Katsuhisa: *See—*
Toyoshima, Shigeru; Honda, Mamoru; Nakamura, Katsuya; and Seki, Katsuhisa, 3,979,648.

Sekiya, Fukuo; and Morokawa, Shigeru, to Citizen Watch Co., Ltd. Solid state binary logic signal source for electronic timepiece or the like. 3,979,608, Cl. 307-247.00A.

Seko, Kiyoshi: *See—*
Sogo, Yukio; Ido, Kazuo; Seko, Kiyoshi; and Takahashi, Hiroshi, 3,979,172.

Seligman, Lawrence, to Data General Corporation. Code recognition record medium and technique. 3,979,577, Cl. 235-61.12N.

Selleck, James Earl: *See—*
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Selling, Hendrak Johannes; Van Lingen, Hendrik; and Han, Njo Hong, to Nederlande Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid Handle En Verkeer. Method for the manufacture of voluminous blended yarns and fabrics and knittings to be manufactured from them. 3,979,177, Cl. 8-115.700.

Selzer, Robert J., to International Harvester Company. Adjustable steering column. 3,978,740, Cl. 74-493.000.

Sensi, Piero: *See—*
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Senturion Sciences, Inc.: *See—*
Silverman, Daniel; and Bailey, John R., 3,979,140.

Sether, Walter H., to Mobil Oil Corporation. Package construction of articles with shrink film. 3,978,638, Cl. 53-30.00S.

Seto, Yoshito: *See—*
Nagasaki, Katsumi; Seto, Yoshito; and Yamasaki, Hiroyuki, 3,979,108.

Severijns, Adrianus Petrus; and Staas, Frans Adrianus, to U.S. Philips Corporation. Refrigeration method and apparatus by converting ^3He to A superfluid. 3,978,682, Cl. 62-113.000.

Seymour, David Jackson: *See—*
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Sgurov, Vasil Stoyanov: *See—*
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Sham Progetti S.p.A.: *See—*
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Shamlian, Ralph B., to Farallon Industries, Inc. Swim fin including means for maintaining foot and leg in fixed relationship. 3,978,537, Cl. 9-309.000.

Shanco Plastics & Chemicals Inc.: *See—*
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Shashkina, Galina Alexandrovna: *See—*
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Shaw, Glenn E.; and Deehr, Charles S., to United States of America, Environmental Protection Agency. Coronametric instrument for aerosol measurements. 3,979,596, Cl. 250-575.000.

Shelkov, Sergei Mikhailovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Boiko, Georgy Alexandrovich; Kumysh, Ilya Iosifovich; Puzrin, Leonid Gustavovich; Kovalev, Viktor Alexandrovich; Marinsky, Georgy Sergeevich; Beloglazov, Alexandr Petrovich; Siry, Pavel Osipovich; Sopozhnikov, Alexandr Ivanovich; Nosanov, Valentin Alexandrovich; Babinovich, Volf Iudovich; Popov, Lev Vasilievich; Shelkov, Sergei Mikhailovich; Strukov, Vladimir Nikolaevich; and Babich, Boris Markovich, 3,979,101.

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Sheppard, Robert S.; and Groening, Franklin E., to PPG Industries, Inc. Preparation of finely-divided refractory powders of groups III-V metal borides, carbides, nitrides, silicides and sulfides. 3,979,500, Cl. 423-289.000.

Shibata, Kunio: *See—*
Kosaka, Kenzo; Horikawa, Toshio; Uchida, Minoru; Morioka, Shin; Shibata, Kunio; and Takahashi, Eizi, 3,978,647.

Shichman, Daniel: *See—*
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Shih, Hsing-Hua, to Westinghouse Electric Corporation. Fluid current meter. 3,978,726, Cl. 73-189.000.
Shinetsu Chemical Company: *See—*
Kagiya, Tsutomu; Miyoshi, Kunihiko; and Takemoto, Katsuo, 3,979,482.
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Shuffman, Rose: *See—*
Ross, Sigmund L., 3,978,921.
Shupe, Russell D.: *See—*
Tate, Jack F.; Shupe, Russell D.; and Maddox, Jim, Jr., 3,979,315.
Siebert, Curt August. Speaker enclosure. 3,978,941, Cl. 181-151.000.
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Siemens Aktiengesellschaft: *See—*
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Signa, Michael A.: *See—*
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Signetics Corporation: *See—*
Brand, Warren L., 3,979,765.
Sikich, Jack. Corona discharge apparatus. 3,979,193, Cl. 55-123.000.
Silverman, Daniel; and Bailey, John R., to Senturion Sciences, Inc. Seismic method for logging position of a deep borehole in the earth. 3,979,140, Cl. 181-120.000.
Silverman, Daniel. Method and apparatus for transferring a pattern on an overlying web by laser burning into an underlying web. 3,979,591, Cl. 250-317.000.
Silverman, Daniel; and Bailey, John R. Seismic method for determining the position of the bottom of a long pipe in a deep borehole. 3,979,724, Cl. 340-15.5BH.
Silverman, Ronald: *See—*
Bhattacharyya, Arup; Joshi, Madhukar Laxman; Kroll, Charles Thomas; and Silverman, Ronald, 3,978,577.
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Simm, Walter, to AGFA-Gevaert, A.G. Process and apparatus for electrographic recording utilizing contact liquid. 3,979,759, Cl. 346-74.0ES.
Simon, Michael, to Maschinenfabrik Augsburg-Nurnberg AG. LPG burning internal combustion engine, especially Otto engine. 3,978,823, Cl. 123-1.00A.
Simonovits, Emilia: *See—*
Johan, Bela; Szemler, Laszlo; Szontagh, Tamas; Kuti, Laszlo; Simonovits, Emilia; Bekes nee Erdos, Judit; Szekely, Denes; Kiss, Janos; Kovacs nee Komoroczy, Erzsebet; and Hargitai nee Franyo, Aniko, 3,979,259.
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Slany, Erich Hans. Dish washing machine. 3,978,875, Cl. 134-112.000.
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Smart, Thomas John, to Dunlop Limited. Spacer-dampers for power transmission lines. 3,979,553, Cl. 174-42.000.
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Smith, Bob L., to United States of America, Army. Optical pump power distribution feed. 3,979,750, Cl. 343-100.0SA.
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Smith, James D. B., to Westinghouse Electric Corporation. Arsonium latent catalysts for curing epoxy resins. 3,979,355, Cl. 260-37.0EP.
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Smith, Luther B., deceased (by Jordan, William F. L. Fry and Richard E., executors), to L. B. Smith Estates, Inc. Electrotherapeutic treatment head. 3,978,864, Cl. 128-404.000.
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Snyder, Francis H., Jr. Roller traveller device. 3,978,809, Cl. 114-204.000.
Snyder, William B., Jr., to United States of America, Energy Research and Development Administration. Ductile tungsten-nickel alloy and method for making same. 3,979,209, Cl. 75-227.000.
Snyder, William B., Jr.: *See—*
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Soler Font, Eduardo. Winding machine. 3,978,564, Cl. 29-33.00F.
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Sood, Vijay K.; and Streifert, Keith L., to Carrier Corporation. Flexible damped bearing support. 3,979,155, Cl. 308-15.000.
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Spahr, John; McConnaughay, Kenneth E., deceased; and McConnaughay, Esther L., executrix. Method of making a bituminous emulsion. 3,979,323, Cl. 252-311.500.
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Ross, Gerald F.; and Robbins, Kenneth W., 3,979,749.
Stoltzfus, David D.; and Snavely, Benjamin H., 3,979,076.
Spivack, John D.; and Luzzi, John J., to Ciba-Geigy Corporation. Compositions stabilized with benzoyloxybenzamides. 3,979,360, Cl. 260-45.85B.
Spragg, Walter Thomas; and Seatonberry, Brian William, to Australian Atomic Energy Commission. Detector for measuring a radioisotope tracer gas. 3,979,593, Cl. 250-364.000.
Sprague, George R., to Colonial Rubber Works, Inc. Method of making carpet underlay. 3,979,489, Cl. 264-51.000.
Squier, William H.; and Poteat, William E., to M. Lowenstein & Sons, Inc. Process for manufacturing a foamed resin article having a flocked three dimensional surface design. 3,979,487, Cl. 264-24.000.
Staas, Frans Adrianus: *See—*
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Staff, Charles H.: *See—*
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Stahl, Quade R., to Meloy Laboratories, Inc. Method and apparatus for converting nitrogen dioxide to nitric oxide. 3,979,501, Cl. 423-405.000.
Stahler, Fritz: *See—*
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Stahmann, Mark A.; and Wagle, Sudhakar S., to Kremers-Urban Company. Compositions and methods therewith for penicillin hypersensitivity detection. 3,979,508, Cl. 424-9.000.
Standard Oil Company: *See—*
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Stanley, Robert K., to Techniservice Corporation. Yarn treating apparatus. 3,978,559, Cl. 28-1.600.
Stanley, Robert K., to Techniservice Corporation. Strand treatment apparatus. 3,978,560, Cl. 28-1.600.
Stapp, Willis J.; Crowe, Norman P.; and Molitor, Edwin A., to Multifold-International, Inc. Stacking and bundling machine. 3,978,785, Cl. 100-215.000.
Stark, Olof; and Dilot, Rolf, to AB Ziristor. Package comprising a stiff strip. 3,979,048, Cl. 229-48.00T.
Staroselsky, Naum: *See—*
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Statz, Hermann; and Feist, Wolfgang M., to Raytheon Company. Semiconductor with surface insulator having immobile charges. 3,979,629, Cl. 313-367.000.
Stechmann, Helmut, to Kienzle Uhrenfabriken GmbH. Unipolar rotary step motor. 3,979,616, Cl. 310-49.00R.
Stefancsik, Ernest Anton: *See—*
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Sternberg, Stanley R.; Young, James E.; and Lennington, John W., to Bergishagen, Finn; Abbott, John S.; Hutchinson, Kenneth A.; Young, James E.; Lennington, John W.; and Sternberg, Stanley R. Method and system for the infrared analysis of gases. 3,979,589, Cl. 250-252.000.
Stevenson, David John, to Lubrizol Corporation, The. Catalytic converter having plural reaction stages with temperature-comparing means therein. 3,979,185, Cl. 23-288.0FB.
Stevenson, Thomas E.; and Cohen, Kenneth W., to Bailey Meter Company. Pneumatic pressure regulator. 3,978,876, Cl. 137-84.000.
Stima, Joseph Frank, to Colgate-Palmolive Company. Tabs for disposable diapers. 3,978,860, Cl. 128-284.000.
Stith, Morris Randall, Jr. Method of positioning and supporting a machine. 3,978,574, Cl. 29-407.000.
Stoltzfus, David D.; and Snavely, Benjamin H., to Sperry Rand Corporation. Grinding wheel guide means for forage harvester. 3,979,076, Cl. 241-101.200.
Stolzer, Claus; Hammann, Ingeborg; and Unterstenhofer, Gunter, to Bayer Aktiengesellschaft. S-(amidocarbonyl)-methyl-O-alkylmonothiophosphoric acid ester amides. 3,979,512, Cl. 424-200.000.
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Strain, Franklin, to PPG Industries, Inc. Silicate treated asbestos diaphragms for electrolytic cells. 3,979,276, Cl. 204-282.000.

Strang, Robert E., to Injection Plastic Co., Inc., The. Vehicle seat pedestal. 3,979,099, Cl. 248-418.000.

Strasser, Karl, to Siemens Aktiengesellschaft. Fuel cell battery consisting of a plurality of fuel cells. 3,979,224, Cl. 429-18.000.

Strauff, Gunther, to Langen & Co. Pressure follow-up control means for servo-steering systems, and the like. 3,978,770, Cl. 91-372.000.

Strehlke, Gunter; and Osterburg, Gunther, to Deutsche Texaco Aktiengesellschaft. Process for the production of lower aliphatic alcohols. 3,979,465, Cl. 260-639.00R.

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Strike, Donald P.; Kao, Wenling; and Fenichel, Richard L., to American Home Products Corporation. Prostaglandin intermediate. 3,979,446, Cl. 260-514.00D.

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Strunk, Manfred; Kroschel, Heinz; and Voss, Alfred, to Dynamit Nobel Aktiengesellschaft. Retaining ring apparatus. 3,978,795, Cl. 102-56.0SC.

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Sudnishnikov, Boris Vasilievich; Kamensky, Veniamin Viktorovich; Varnello, Eduard Petrovich; Tupitsin, Sergei Konstantinovich; and Nazarov, Boris Vladimirovich. Air-operated drilling machine or rotary-percussive action. 3,978,931, Cl. 175-99.000.

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Sun Ventures, Inc.: *See—*
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Sundstrom, Nils Eskil, to AB Westin & Backlund. Position regulator. 3,978,884, Cl. 137-495.000.

Sundt, Erling, to Firmenich S.A. 9-[9,12-Epoxy-ethyl]-4-methyl tricyclo[6.2.1.0^{2,7}]undec-4-ene and 9-[9,12-epoxy-ethyl]-5-methyl tricyclo[6.2.1.0^{2,7}]undec-4-ene odor-modifying agents. 3,979,338, Cl. 252-522.000.

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Taccone, Ida, to Buskine S.A. Process for the preparation of vincamine and other indole alkaloids. 3,979,395, Cl. 260-293.530.

Tadauchi, Masaharu, to Hitachi, Ltd. Electrostatic recording apparatus with auxiliary electrodes. 3,979,760, Cl. 346-74.0EE.

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Takei, Ichiro; Sasaki, Katsuyoshi; and Nishida, Sumio, to Hitachi, Ltd. Semiconductor element having surface coating comprising silicon nitride and silicon oxide films. 3,979,768, Cl. 357-54.000.

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Tani, Masuzo. Carton construction. 3,979,044, Cl. 229-17.00R.

Tapecon, Inc.: *See—*
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Tarel, Gerard Rene Joseph: *See—*
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Tate, Jack F.; Shupe, Russell D.; and Maddox, Jim, Jr., to Texaco Inc. Method for treating scale. 3,979,315, Cl. 252-180.000.

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Taylor, David H., to Thermo King Corporation. Means for trapping oil lost during startup of refrigerant compressors. 3,978,685, Cl. 62-471.000.

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Termansen, Poul Erik; and Christensen, Thorkild, to Danfoss A/S. Control means for hydrostatic steering systems and the like. 3,978,879, Cl. 137-115.000.

Teshiba, Mitunobu: *See—*
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Theault, Yves. Self-supporting element for roof structures and combinations thereof. 3,978,635, Cl. 52-693.000.

Theissen, Robert J., to Mobil Oil Corporation. Substituted phenoxybenzoic acids and derivatives thereof. 3,979,437, Cl. 260-471.00R.

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Thiele, Willi; Wendt, Gerd-Joachim; and Heyden, Werner, to Hauni-Werke Korber & Co., KG. Method of conditioning tobacco. 3,978,868, Cl. 131-135.000.

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Thomson-Leeds, Company, Inc.: *See—*
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Thornburg, David D., to Xerox Corporation. Non-crystalline device memory array. 3,979,586, Cl. 250-209.000.

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Three Sisters Ranch Enterprises: *See—*
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Tierce, James Allen. Automatic multiple unit control apparatus. 3,979,060, Cl. 236-46.00R.

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Timmler, Helmut; and Lurssen, Klaus, to Bayer Aktiengesellschaft. Plant growth regulant compositions comprising 2-cyano-bicyclo[2,2,1]heptane. 3,979,204, Cl. 71-105.000.

Timtner, Karlheinz, to Ringspann Albrecht Maurer K.G. Frictional overrunning clutch. 3,978,949, Cl. 192-41.00A.

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Tischlinger, Edward A., to MPL, Inc. Glass tube and thermoplastic resin finger grip sleeve assembly. 3,978,858, Cl. 128-237.000.

Tiso, Albert: *See—*
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Titan Verpackungs System GmbH: *See—*
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Titcomb, Stanley T.; and Juers, Arthur A., to International Telephone and Telegraph Corporation. Reduced calorie bread and method of making same. 3,979,523, Cl. 426-19.000.

Tokico Ltd.: *See—*
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Tokiwa, Fumikatsu; and Kobayashi, Takehiko, to Kao Soap Co., Ltd. Stabilized sodium percarbonate composition. 3,979,318, Cl. 252-186.000.

Tokyo Plywood Kabushiki Kaisha: *See—*
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Tokyo Shibaura Electric Co., Ltd.: *See—*
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Tomlin, Robert Derrick, to Magnatex Limited. Windscreen wipers. 3,978,543, Cl. 15-250.420.

Tomozawa, Atsushi, to Communications Satellite Corporation (Comsat). Non-recursive digital filter employing simple coefficients. 3,979,701, Cl. 333-70.00T.

Tooley, John R.; Scott, Larry D.; and Chalkley, Hatcher E., to Texas Instruments Incorporated. Multiple block binary synchronous duplex communications system and its method of operation. 3,979,719, Cl. 340-146.1BA.
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Tosches, Anthony J., to Rockwell International Corporation. Weft extending carrier. 3,978,897, Cl. 139-448.000.
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Toth, Istvan Tibor; Bite, Pal; Magyar, Gyorgy; Diszler, Eszter; Borsy, Jozsef; Maderspach, Andrea; Polgari, Istvan; Elek, Sandor; and Elekes, Istvan, to Gyogyszer- es Vegyeszeti Termekek Gyara RT. 2-Oxazoline derivatives. 3,979,405, Cl. 260-307.00F.
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Townsend, Douglas W. Electrolytic method. 3,979,267, Cl. 204-130.000.
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Trabucco, Hector Osvaldo. Implantable pacemaker and electrode member therefor. 3,978,865, Cl. 128-419.00P.
Trani, Aldo, to Gruppo Lepetit S.p.A. 2-(Pyrrol-1-yl)amino-4,5-dihydro-1H-imidazole derivatives. 3,979,408, Cl. 260-309.600.
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Trecker, David John; Borden, George Wayne; and Smith, Oliver Wendell, to Union Carbide Corporation. Method for curing acrylated epoxidized soybean oil amine compositions. 3,979,270, Cl. 204-159.140.
Trendafilov, Stefan Petrov: *See—*
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Trostel, Louis J., Jr., to Norton Company. Sintered alumina body. 3,979,214, Cl. 106-44.000.
Trouiller, Jean-Claude, to Schlumberger Technology Corporation. Acoustic well logging methods and apparatus. 3,978,939, Cl. 181-104.000.
Troyer, Richard Lloyd, to Johns-Manville Corporation. Insulating material and methods of manufacture. 3,979,537, Cl. 428-61.000.
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Uhl, Gerald A.; and Pennock, Johannes J. M. Bicycle exercising apparatus. 3,979,113, Cl. 272-73.000.
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Umeda, Hiroyuki, to Victor Company of Japan, Limited. Automatic tape loading type recording and/or reproducing apparatus. 3,979,772, Cl. 360-85.000.
Umeda, Shozo; Hirose, Tadatsugu; and Andoh, Shizuo, to Fujitsu Ltd. Method of driving a plasma display panel. 3,979,718, Cl. 340-324.00M.
Umemoto, Masuo; Tomatsuri, Kouichi; and Kanazawa, Yasunori, to Hitachi, Ltd. Pulse code modulation recording and reproducing apparatus. 3,979,721, Cl. 340-146.10F.
Underwood, Lawrence E. Portable balloon antenna support structure. 3,979,753, Cl. 343-706.000.
Union Carbide Corporation: *See—*
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van den Berg, Frederik Louis, to U.S. Philips Corporation. Transmission device of a radiographic navigation system. 3,979,751, Cl. 343-106.00R.

van den Berg, Johan H.; van Eekelen, Alex H.; and Hoebrechts, Albert G., to Monroe Belgium N.V. Windshield wiper construction. 3,978,544, Cl. 15-250.420.

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Vandermeirsch, Marcel A., to Fabrique Nationale Herstal S.A. Needle bed for flat knitting machines. 3,978,689, Cl. 66-75.00R.

van der Ven, Robert Fransiscus Laurentius Maria, to U.S. Philips Corporation. Cathode ray tube with electrostatic multipole focusing lens. 3,979,631, Cl. 313-450.000.

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Varnello, Eduard Petrovich: *See—*
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Vassilev, Hristo Dimitrov; Zahariev, Simeon Assenov; and Donev, Danail Yovchev, to DSO "Pharmachim. Method for obtaining tetracyclinehydrochloride. 3,979,269, Cl. 204-158.00S.

Vattier, Claude Louis Albert. Support for securing a slab to an upright. 3,979,098, Cl. 248-247.000.

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Vorbach, Guenther; and Mueller, Wolfgang Peter, to Siemens Aktiengesellschaft. Paper guide for tape perforators with an automatic pitch-adapted threading mechanism for the feed element zone. 3,979,036, Cl. 226-83.000.

Voss, Alfred: *See—*
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Vroman, William Riley, to Chrysler Corporation. Method of making a catalytic reactor for automobile. 3,978,567, Cl. 29-157.00R.

Vulliez-Sermet, Pierre Roland Edouard; and Fiorentino, Elio, to Rohm and Haas Company. Adsorption process. 3,979,287, Cl. 210-40.000.

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Walker, Brooks; and Hall, Fred V., to Walker, Brooks. Servo mechanism. 3,978,832, Cl. 123-117.00A.
Walker, Charles E., to Kaiser Aluminum & Chemical Corporation. Container bottom structure. 3,979,009, Cl. 220-66.000.
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Walsh, Robert J., to Monsanto Company. Process for chemical-mechanical polishing of III-V semiconductor materials. 3,979,239, Cl. 156-4.000.
Walters, Robert B., to General Electric Company. Polymeric composition and insulated products. 3,979,356, Cl. 260-42.260.
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Modersohn, Charles W., 3,978,947.
Warner, Henry B. Device for retaining face warmth. 3,978,533, Cl. 5-327.00R.
Warwick, Thomas R., to United Technologies Corporation. Hysteresis compensator for control systems. 3,979,682, Cl. 328-162.000.
Water Pollution Control Corporation: *See—*
Bykowski, Michael J.; and Ewing, Lloyd, 3,979,289.
Waters, Peter James: *See—*
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Weaver, Ronald Ray: *See—*
Hufstedler, Alferd Gene; Weaver, Ronald Ray; and Slater, Billy Ray, 3,979,715.
Webb, Colin Frederick; and Price, Barry John, to Allen & Hanburys Limited. 4'-Chloro-4-ethynylbiphenyl and method of preparing same. 3,979,468, Cl. 260-649.0DP.
Webber, Steven Hugh: *See—*
Lange, Ronald Edwin; Dobberstein, Riley H.; and Webber, Steven Hugh, 3,979,726.
Weber, Ewald: *See—*
Merkel, Rudolf; Schnell, Friedrich; and Weber, Ewald, 3,978,624.
Weber, Paul L.: *See—*
Braber, Robert J.; and Weber, Paul L., 3,979,020.
Weber, Robert L., to Caterpillar Tractor Co. V-Type internal combustion engine. 3,978,828, Cl. 123-55.0VE.
Wedding, William Ray; and Kiss, John David, to International Telephone and Telegraph Corporation. Sighting device for luminaire positioning. 3,978,590, Cl. 33-263.000.
Weeks, Charles B.; and Choate, Paul V., to Norris Industries, Inc. Removable receptacle for trash compactor. 3,979,008, Cl. 220-65.000.
Wegener, Horst A. R.: *See—*
Kroger, Harry; and Wegener, Horst A. R., 3,979,613.
Wegmuller, Hans; and Haase, Jaroslav, to Ciba-Geigy Corporation. Process for the purification of industrial effluents. 3,979,285, Cl. 210-36.000.
Weimann, Gunter: *See—*
Bernt, Erich; Gruber, Wolfgang; Haid, Erich; Stahler, Fritz; Wahlefeld, August Wilhelm; and Weimann, Gunter, 3,979,447.
Weinar, Roger N. Removable wire tie for adhesive applied wallboard installation. 3,978,626, Cl. 52-127.000.
Weinhold, Karl. Device for detachably fastening hose or pipe ends. 3,979,143, Cl. 285-243.000.
Weis, Joseph August: *See—*
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Weisenthal, Marvin L. Closure member for balloons. 3,978,555, Cl. 24-255.0SL.
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Weissner, Rudiger: *See—*
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Pulitzer, Sidney C.; and Gouner, Aubrey L., 3,978,594.
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Werkzeugmaschinenfabrik Adolf Waldrich Coburg: *See—*
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Werling, John M. Hora d'oeuvres oven. 3,978,782, Cl. 99-446.000.
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Western Stamping Corporation: *See—*
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Lu, Chien Shiong, 3,978,885.
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White, Allen Andrew; Adee, Ray Addison; and Knopp, Ronald Henry, to Hesston Corporation. Method and apparatus for processing crop stacks. 3,979,074, Cl. 241-30.000.
White, George Raymond, to Smith Kline & French Laboratories Limited. Sulphoxides. 3,979,398, Cl. 260-294.80F.
White Sewing Machine Company: *See—*
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White-Westinghouse Corporation: *See—*
Hughes, John D.; and Klingensmith, Al W., 3,978,694.
Whited, Charles A., to Xerox Corporation. Monitoring device. 3,979,022, Cl. 222-23.000.
Whiteley, Eric, to Canadian General Electric Co. Ltd. Permanent magnet field structure for dynamoelectric machines. 3,979,619, Cl. 310-268.000.
Whiteley, Eric, to Canadian General Electric Co. Ltd. Segmental discoidal winding structure for dynamoelectric machines. 3,979,620, Cl. 310-268.000.
Whitener, Philip C.: *See—*
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Whittle, Benjamin. Apparatus for repairing tire casings. 3,979,169, Cl. 425-12.000.
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Wilbur, Charles J., to Quaker Oats Company, The. Special shipping case having modified end flaps. 3,979,046, Cl. 229-37.00R.
Wild, Albert F., to Tapecon, Inc. System for preventing erasure of audio recordings. 3,979,770, Cl. 360-60.000.
Wild, Gene M., to Eli Lilly and Company. Purification process for 7-aminocephalosporins. 3,979,383, Cl. 260-243.00C.
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Wilkens, Arnold J., to Lawrence Peska Associates, Inc., a part interest. Cooking vessels having integral gas and burner assembly. 3,978,844, Cl. 126-38.000.

Wilkinson, Robert E., to Rostone Corporation. Composite of metal and thermoset plastic. 3,979,549, Cl. 428-450.000.

William H. Rorer, Inc.: *See—*
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William L. Bonnell Company, The: *See—*
Echols, Charles W., Sr., 3,978,629.

Williams, Martin D. Device for extracting bushings from a bushing support. 3,978,573, Cl. 29-267.000.

Williams, Robert Ernest; and Marritt, Clifford Russell, to Molins Limited. Method and apparatus for the manufacture of filter-tipped cigarettes. 3,978,969, Cl. 198-461.000.

Willy, Erazm Alfred. Electromagnetic transducer. 3,979,566, Cl. 179-115.5ES.

Willyard, James C. Air nozzle controlled marine propulsion system. 3,978,814, Cl. 115-15.000.

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Wing, Robert E.; and Doane, William M., to United States of America, Agriculture. Removal of heavy metal ions from aqueous solutions with insoluble cross-linked-starch-xanthates. 3,979,286, Cl. 210-38.00B.

Winter, Klaus, to ITT Industries, Inc. Method of manufacturing a rotor for vane type engines. 3,978,570, Cl. 29-156.40R.

Winter, Roland A. E., to Ciba-Geigy Corporation. α,β-unsaturated schiff-base chain extension reactions for polyimides and polyamide-imides. 3,979,350, Cl. 260-30.200.

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Wittenzellner, Ernst, to Siemens Aktiengesellschaft. Protective circuit for short-circuit and overload protection of a power circuit. 3,979,645, Cl. 317-33.00R.

Wochnowski, Waldemar, to Hauni-Werke Korber & Co., KG. Apparatus for increasing the volume of moist tobacco. 3,978,867, Cl. 131-133.00R.

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Wolf, Klaus: *See—*
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Worsham, Ronald E. Football dart board game. 3,979,117, Cl. 273-102.00B.

Worst, Joseph C., to General Electric Company. Belt drive mechanism for automatic clothes washing machine. 3,978,693, Cl. 68-12.00R.

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Yahner, Joseph A., to Eli Lilly and Company. 3-Cyanamino-2,6-dinitroanilines. 3,979,453, Cl. 260-551.00C.

Yamagata, Seiichi; and Susami, Kozo, to Toray Industries, Inc. Helically wrapped yarn. 3,978,648, Cl. 57-144.000.

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Yan, Tsoung-Yuan, to Mobil Oil Corporation. Treatment of lube stock for improvement of oxidative stability. 3,979,279, Cl. 208-264.000.

Yanagisawa, Yuzuru; Ohgoshi, Akio; Nakayama, Akira; and Muramoto, Shoichi, to Sony Corporation. Indicator display tube. 3,979,623, Cl. 313-190.000.

Yanikoski, Florian F.: *See—*
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Yankee, Ernest W., to Upjohn Company, The. 8β,12α-17-Phenyl-18,19,20-trinor-PGF$_2$ compounds. 3,979,435, Cl. 260-473.00A.

Yankee, Ernest W., to Upjohn Company, The. 8β,12α-17-Phenyl-18,19,20-trinor-PGE$_2$ compounds. 3,979,438, Cl. 260-473.00A.

Yankee, Ernest W., to Upjohn Company, The. 8β,12α-17-Phenyl-18,19,20 trinor PGF$_2$ compounds. 3,979,439, Cl. 260-473.00A.

Yanshevsky, Vladimir Avgustovich: *See—*
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Yasui, Moroshi: *See—*
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Yates, Colin K., to American Optical Corporation. Microchannel plates. 3,979,621, Cl. 313-105.0CM.

Yates, James E.; and Pinto, Wilfred M., to Continental Oil Company. Friable composition and process. 3,979,345, Cl. 260-23.0XA.

Yates, James E., to Continental Oil Company. Process for condensation of alcohols. 3,979,466, Cl. 260-642.00C.

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Yen, David H.; Connelly, Tim R.; and Lee, John J., to Filac Corporation. Monitoring apparatus and method for blood pressure and heart rate. 3,978,848, Cl. 128-2.05M.

Yonkers, Robert A., to Bissell, Inc. Floor sweeper with auxiliary rotary brushes. 3,978,539, Cl. 15-42.000.

Yorksie, Daniel S., to Westinghouse Electric Corporation. Battery monitor with automatic scale and recycle prevents. 3,979,657, Cl. 320-13.000.

Yoshida Kogyo Kabushiki Kaisha: *See—*
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Murasaki, Ryuichi, 3,978,895.

Yoshikawa, Eiji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Control device for a vacuum advancer. 3,978,831, Cl. 123-117.00A.

Yoshino, Masahito, to Kabushiki Kaisha Suwa Seikosha. Step motor for quartz crystal electronic timepiece. 3,978,651, Cl. 58-23.00D.

Yoshioka, Hideaki. Oil hydraulic motor. 3,978,665, Cl. 60-325.000.

Young, James E.: *See*—
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Young, Michael W. K., to Oriental Buying Service, Inc. Flower pot holder. 3,978,612, Cl. 47-40.000.
Young, Thomas A.: *See*—
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Yuko Shindosho Company Limited: *See*—
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Zabie, Jack L.: *See*—
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Zachman, Neil J., to Cabot Corporation. Diamond wire drawing die blanks and methods of making the same. 3,978,744, Cl. 76-107.00A.
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Zandstra, Lawrence, to Rowe International Inc. Ticket vendor. 3,978,958, Cl. 194-2.000.
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Zavasnik, Fred J., to Continental Can Company, Inc. Process for the manufacture of an oriented container. 3,979,491, Cl. 264-97.000.
Zecher, Wilfried; and Merten, Rudolf, to Bayer Aktiengesellschaft. Reaction products containing free isocyanato groups. 3,979,421, Cl. 260-453.00P.
Zelikman, Evgeny Semenovich: *See*—
Moskovich, Jury Leonidovich; Juriev, Jury Nikolaevich; Tsyskovsky, Viktor Karlovich; Berezova, Ljudmila Vasilievna; Gilchenok, Nokhum Davidovich; Yanshevsky, Vladimir Avgustovich; Mushenko, Dmitry Vasilievich; Zelikman, Evgeny Semenovich; Filippova, Rufina Alexandrovna; Klimenko, Vladimir Leonidovich; and Sobolev, Valerian Mikhailovich, 3,979,450.
Zemanek, Joseph, Jr., to Mobil Oil Corporation. Two-receiver, variable-density logging system. 3,979,714, Cl. 340-15.5DS.
Zenith Radio Corporation: *See*—
Palac, Kazimir, 3,978,562.
Zerrweck, Willy, to Chemische Werke Huls Aktiengesellschaft. Process for separating isobutylene from C_4 hydrocarbon mixtures. 3,979,474, Cl. 260-677.00S.
Zhabotinsky, Mark Efremovich: *See*—
Alexeev, Nikolai Efimovich; Buzhinsky, Igor Mikhailovich; Zhabotinsky, Mark Efremovich; Izyneev, Anatoly Andreevich; Koryagina, Elizaveta Ivanovna; Kravchenko, Valery Borisovich; Rudnitsky, Jury Petrovich; Gapontsev, Valentin Pavlovich; and Tsapkin, Vadim Vasilievich, 3,979,322.
Ziegenhain, William C.; Porchey, David V.; and Ferrell, Ralph T., to Continental Oil Company. Calcining method for alumina. 3,979,504, Cl. 423-628.000.
Zieger, Claus D., to Interbath, Inc. Mounting arrangement for hand-held shower head. 3,979,096, Cl. 248-75.000.
Zimmer, Jerry W.: *See*—
Mudge, John L.; Zimmer, Jerry W.; and Taft, Keith G., 3,979,612.
Zinchenko, Dmitry Ivanovich: *See*—
Golosman, Evgeny Zinovievich; Sobolevsky, Viktor Stanislavovich; Lytkin, Viktor Petrovich; Axenov, Nikolai Nikitovich; Golovkova, Alexandra Ivanovna; Peker, Yakov Anatolievich; Zinchenko, Dmitry Ivanovich; and Ruzinsky, Sergei Ivanovich, 3,979,336.
Zinnbauer, Gerald Boyd, to Eli Lilly and Company. Two-piece case. 3,978,985, Cl. 206-387.000.
Zirconal Processes Limited: *See*—
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Zirngibl, Ulrich, to Sandoz Ltd. Para-amino-β-cyano-bis-styryl compounds. 3,979,429, Cl. 260-463.000.
Zollinger, Howard A.; and Lubbers, LeRoy, to Rapistan, Incorporated. Mobile tier picking apparatus for a warehousing system. 3,978,995, Cl. 214-16.40A.
Zollweg, Robert J.: *See*—
Liu, Chi-sheng; Hirayama, Chikara; Zollweg, Robert J.; and Madia, Ronald A., 3,979,624.
Zubkov, Alexandr Mikhailovich: *See*—
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Zucchinelli, Mario, to S.A.E.S. Getters S.p.A. Getter device. 3,979,166, Cl. 417-48.000.
Zuckert, Bertram; and Schmut, Wolfgang, to Vianova-Kunstharz A.G. Emulsifiers for preparing aqueous dispersions of alkyd resins. 3,979,346, Cl. 260-23.0CP.
Zumalt, Michael D.; Hofmann, Neil R.; and Bassett, Melvin C., to United States of America, Army. Chemical detection of nitrogen containing compounds. 3,979,182, Cl. 23-232.00R.
Zundorf, Dieter: *See*—
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF SEPTEMBER, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Baker, Cole H.; Geis, James D.; Gluz, Harry; and Troll, John H., to Kaye Thermometer Corporation. Automatic thermometer calibration system. Re. 28,954, Cl. 73-1.00F.

Drelich, Arthur H.; and Lukacs, George J., to Johnson & Johnson. Synthetic resin compositions and methods of utilizing the same. Re. 28,957, Cl. 427-331.000.

Geis, James D.: *See*—
Baker, Cole H.; Geis, James D.; Gluz, Harry; and Troll, John H., Re. 28,954.

Gluz, Harry: *See*—
Baker, Cole H.; Geis, James D.; Gluz, Harry; and Troll, John H., Re. 28,954.

Horizons Research Incorporated: *See*—
Wainer, Eugene, Re. 28,956.

International Business Machines Corporation: *See*—
Zafiropulo, Pietro Alois; and Zihlmann, Franz Xaver, Re. 28,958.

International Harvester Company: *See*—
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136 3,978,627
188 3,978,628
235 3,978,629
236 3,978,630
239 3,978,631
309 3,978,632
400 3,978,633
646 3,978,634
693 3,978,635

CLASS 53
21FW 3,978,636
28 3,978,637
30S 3,978,638
32 3,978,639
37 3,978,640
53 3,978,641
159 3,978,642
160 3,978,643

CLASS 54
44 3,978,644

CLASS 55
68 3,979,191
87 3,979,192
123 3,979,193
131 3,979,189
158 3,979,190
296 3,979,194

CLASS 56
310 3,978,645

CLASS 57
58.95 3,978,646
140R 3,978,647
144 3,978,648

CLASS 58
23AC 3,978,650
23D 3,978,651
3,978,652
3,978,654
23R 3,978,649
3,978,653
126R 3,978,655

CLASS 60
39.09P 3,978,656
39.12 3,978,657
39.27 3,978,658
39.28R 3,978,659
39.51R 3,978,660
39.55 3,978,661
39.65 3,978,662
39.67 3,978,663
39.69 3,978,664
325 3,978,665
327 3,978,666
403 3,978,667
447 3,978,668
464 Re.28,953
549 3,978,669
562 3,978,670
598 3,978,671
670 3,978,672

CLASS 61
35 3,978,673
39 3,978,674
45F 3,978,675
65 3,978,676
72.4 3,978,679
108 3,978,677
112 3,978,678

CLASS 62
6 3,978,680
51 3,978,681
113 3,978,682
174 3,978,683
324 3,978,684
471 3,978,685
514R 3,978,686
525 3,978,687

CLASS 65
1 3,979,195
25R 3,979,196
135 3,979,197

CLASS 66
60 3,978,688
75R 3,978,689
168 3,978,691
205 3,978,690

CLASS 68
5D 3,978,692
12R 3,978,693
18R 3,978,694
20 3,978,695
62 3,978,556
158 3,978,696

CLASS 70
68 3,978,697
165 3,978,698
232 3,978,699
339 3,978,700

CLASS 71
1 3,979,198
40 3,979,199
86 3,979,200
91 3,979,201
98 3,979,202
103 3,979,203
105 3,979,204

CLASS 72
2 3,978,701
42 3,978,702
131 3,978,703
303 3,978,704
325 3,978,705
389 3,978,706

CLASS 73
1F Re.28,954
3 3,978,707
3,978,708
40.5R 3,978,709
49.3 3,978,710
67.2 3,978,711
67.5R 3,978,712
67.7 3,978,713
67.8S 3,978,714
71.2 3,978,715
86 3,978,716
104 3,978,717
115 3,978,719
116 3,978,720
117.3 3,978,718
119A 3,978,721
141R 3,978,722
471 3,978,723
180 3,978,724
182 3,978,725
189 3,978,726
194E 3,978,727
212 3,978,728
359R 3,978,729
387 3,978,730
407PR 3,978,731
421.5R 3,978,732
423R 3,978,733
432R 3,978,734

CLASS 74
89.15 3,978,735
112 3,978,736
242.11C 3,978,737
471XY 3,978,738
473R 3,978,739
493 3,978,740
568R 3,978,741
751 3,978,742
869 3,978,743

CLASS 75
10R 3,979,205
67R 3,979,206
121 3,979,207
154 3,979,208
227 3,979,209

CLASS 76
107A 3,978,744

CLASS 82
2B 3,978,745

CLASS 83
1 3,978,746
18 3,978,747
53 3,978,748
169 3,978,749
208 3,978,750
403 3,978,751
678 3,978,752
3,978,753

CLASS 84
1.21 3,978,754
1.24 3,978,755
470 3,978,756
485R 3,978,757

CLASS 85
9R 3,978,758
10E 3,978,759
47 3,978,760
61 3,978,761

CLASS 89
14C 3,978,762
198 3,978,763

CLASS 90
13.05 3,978,764
24R 3,978,765
24.5 3,978,766
58B 3,978,767

CLASS 91
189R 3,978,768
35EA 3,978,769
372 3,978,770
491 3,978,771

CLASS 92
158 3,978,772

CLASS 93
37SP 3,978,773
51HW 3,978,774
77CL 3,978,775

CLASS 96
1.5 3,979,210
29R 3,979,211
48HD Re.28,956
86R 3,979,212
108 3,979,213

CLASS 98
58 3,978,776
115K 3,978,777

CLASS 99
281 3,978,778
353 3,978,779
422 3,978,780
423 3,978,781
446 3,978,782

CLASS 100
53 3,978,783
170 3,978,784
215 3,978,785

CLASS 101
114 3,978,786
115 3,978,787
211 3,978,789
363 3,978,788

CLASS 102
4 3,978,790
28R 3,978,791
38 3,978,792
3,978,793
42R 3,978,794
56SC 3,978,795
67 3,978,796
70.2P 3,978,797
71 3,978,798

CLASS 106
44 3,979,214
55 3,979,215
62 3,979,216
88 3,979,217
90 3,979,218
271 3,979,219

CLASS 108
28 3,978,799

CLASS 112
79R 3,978,800
176 3,978,801
254 3,978,802

CLASS 113
120A 3,978,803

CLASS 114
.5D 3,978,804
3,978,807
.5F 3,978,805
43.5VC 3,978,806
74A 3,978,808
204 3,978,809
230 3,978,810
235B 3,978,811

CLASS 115
1B 3,978,812
6 3,978,813
15 3,978,814
70 Re.28,955

CLASS 118
69 3,978,815
426 3,978,816
637 3,978,817

CLASS 119
1 3,978,818
22 3,978,819
106 3,978,820

CLASS 122
5 3,978,821
510 3,978,822

CLASS 123
1A 3,978,823
8.09 3,978,824
8.45 3,978,825
3,978,826
46R 3,978,827
55VE 3,978,828
90.15 3,978,829
90.67 3,978,830
117A 3,978,831
3,978,832
117R 3,978,833
119A 3,978,834
119F 3,978,835
122G 3,978,836
139E 3,978,837
148CA 3,978,838
187.5R 3,978,839
193CH 3,978,840

CLASS 124
50 3,978,841

CLASS 125
23R 3,978,842

CLASS 126
21A 3,978,843
38 3,978,844
39R 3,978,845

CLASS 128
2F 3,978,846
2.05M 3,978,848
2.05T 3,978,849
2.06A 3,978,856
2.1B 3,978,847
9 3,978,850
49 3,978,851
62A 3,978,852
84R 3,978,853
142.2 3,978,854
156 3,978,855
214R 3,978,857
237 3,978,858
272 3,978,859
284 3,978,860
287 3,978,861
317 3,978,862
348 3,978,863
404 3,978,864
419P 3,978,865

CLASS 131
2 3,978,866
133R 3,978,867
135 3,978,868
261B 3,978,869

CLASS 132
11R 3,978,870
73 3,978,871
89 3,978,872

CLASS 133
8A 3,978,873

CLASS 134
10 3,979,220
99 3,979,221
107 3,978,874
112 3,978,875

CLASS 136
208 3,979,226
232 3,979,229

CLASS 137
84 3,978,876
90 3,978,877
102 3,978,878
115 3,978,879
315 3,978,880
318 3,978,881
344 3,978,882
489.5 3,978,883
495 3,978,884
560 3,978,885
565 3,978,886
624.15 3,978,887
625.19 3,978,888
630.14 3,978,889
636.4 3,978,890

CLASS 138
42 3,978,891
89 3,978,892

CLASS 139
370.2 3,978,893
383R 3,978,894
431 3,978,895
435 3,978,896
448 3,978,897
449 3,978,898

CLASS 140
93.2 3,978,899

CLASS 141
11 3,978,900

CLASS 148
1.5 3,979,230
12R 3,979,231
20.3 3,979,232
31.55 3,979,233
126 3,979,234
175 3,979,235

CLASS 149
19.8 3,979,236

CLASS 150
.5 3,978,901
34 3,978,902

CLASS 156
3 3,979,237
3,979,238
4 3,979,239
8 3,979,240
13 3,979,241
71 3,979,242
109 3,979,243
179 3,979,244
184 3,979,245
187 3,979,246
297 3,979,247
358 3,979,248
416 3,979,249
425 3,979,250
435 3,979,251
512 3,979,252

CLASS 157
1.2 3,978,903

CLASS 160
345 3,978,904
378 3,978,905

CLASS 162
145 3,979,253
299 3,979,254

CLASS 164
39 3,978,906
52 3,978,907
72 3,978,908
273R 3,978,909
283M 3,978,910
286 3,978,911

CLASS 165
4 3,978,912
7 3,978,913
3,978,914
11 3,978,915
49 3,978,916
95 3,978,917
109 3,978,918
135 3,978,919

CLASS 166
57 3,978,921
224A 3,978,922
224R 3,978,923
241 3,978,924
258 3,978,920
261 3,978,925
267 3,978,926
273 3,978,927
294 3,978,928

CLASS 172
42 3,978,929

CLASS 174
15R 3,979,552
42 3,979,553
177 3,979,554

CLASS 175
94 3,978,930
99 3,978,931
249 3,978,932
325 3,978,933

CLASS 176
20R 3,979,255
22 3,979,256
54 3,979,257
86R 3,979,258

CLASS 178
6.8 3,979,555
7.2 3,979,556

CLASS 179
1SA 3,979,557
1.5R 3,979,558
2DP 3,979,559
6R 3,979,560
15A 3,979,561
84VF 3,979,562
99 3,979,563
100.4ST 3,979,564
110A 3,979,565
115.5ES 3,979,566
175.1A 3,979,567

CLASS 180
2 3,978,934
9.62 3,978,935
31 3,978,936
44F 3,978,937
68R 3,978,938

CLASS 181
104 3,978,939
120 3,978,940
3,979,140
151 3,978,941

CLASS 182
75 3,978,942
155 3,978,943
162 3,978,944

CLASS 188
218XL 3,978,945

CLASS 192
4A 3,978,946
12BA 3,978,947
18B 3,978,948
41A 3,978,949
3,978,950
53C 3,978,951
58B 3,978,952
84C 3,978,953
89B 3,978,955
89R 3,978,954
105A 3,978,956

CLASS 193
1 3,978,957

CLASS 194
2 3,978,958
4R 3,978,959
55 3,978,960
97A 3,978,962

CLASS 195
28VB 3,979,259
36C 3,979,260
65 3,979,261
103.5R 3,979,262
3,979,263
139 3,979,264

CLASS 197
89 3,978,961
114R 3,978,963
127R 3,978,964
151 3,978,965
176 3,978,966
177 3,978,967

CLASS 198
339 3,978,968
394 3,978,979
401 3,978,973
425 3,978,970
461 3,978,969
462 3,978,971
601 3,978,978
617 3,978,976
782 3,978,974
3,978,975
816 3,978,977
836 3,978,972

CLASS 200
5A 3,979,568
61.04 3,979,569
264 3,979,570
328 3,979,571

CLASS 204
24 3,979,223
105R 3,979,265
119 3,979,266
130 3,979,267
140 3,979,268
158S 3,979,269
159.14 3,979,270
192 3,979,271
3,979,272
3,979,273
195B 3,979,274
198 3,979,275
282 3,979,276

CLASS 206
45.14 3,978,980
276 3,978,981
326 3,978,982
364 3,978,983
379 3,978,984
387 3,978,985

CLASS 208
143 3,979,277
3,979,278
264 3,979,279
310R 3,979,280
311 3,979,281

CLASS 209
112 3,978,986
121 3,978,987
166 3,979,282

CLASS 210
11 3,979,283
22A 3,979,284
36 3,979,285
38B 3,979,286
40 3,979,287
42S 3,979,288
79 3,979,289
83 3,979,290
84 3,979,291
90 3,979,292
96R 3,979,293
195S 3,979,294
232 3,979,297
3,979,298
321B 3,979,295
324 3,979,296
387 3,979,299

CLASS 211
113 3,978,988

CLASS 212
1 3,978,989
9 3,978,990

CLASS 214
1BB 3,978,992
1BT 3,978,991
2.5 3,978,994
16.4A 3,978,995
17D 3,978,996
22.5 3,978,993
63 3,978,997
132 3,978,998
314 3,978,999

CLASS 215
12R 3,979,000
217 3,979,001
256 3,979,002
3,979,003
341 3,979,004

CLASS 219
10.49 3,979,572
10.55D 3,979,573
208 3,979,574
407 3,979,575
489 3,979,576

CLASS 220
9LG 3,979,005
19 3,979,006
23 3,979,007
65 3,979,008
66 3,979,009
86R 3,979,010
94R 3,979,011
231 3,979,012
234 3,979,013
240 3,979,014
307 3,979,015
315 3,979,016

CLASS 221
7 3,979,017
10 3,979,018
48 3,979,019
63 3,979,020

CLASS 222
1 3,979,021
23 3,979,022
61 3,979,023
67 3,979,024
95 3,979,025
167 3,979,026
193 3,979,027
380 3,979,028
402.17 3,979,029
415 3,979,030
592 3,979,031
593 3,979,032
604 3,979,033

CLASS 224
5W 3,979,034
42.24 3,979,035

CLASS 226
83 3,979,036
97 3,979,037
3,979,038

CLASS 227
60 3,979,039
113 3,979,040

CLASS 228
49 3,979,041
183 3,979,042
205 3,979,043

CLASS 229
17R 3,979,044
23R 3,979,045
37R 3,979,046
44CB 3,979,047
48T 3,979,048
60 3,979,049
66 3,979,050
72 3,979,051

CLASS 232
43.1 3,979,052
43.2 3,979,053
3,979,054

CLASS 235
61.11E 3,979,578
61.12N 3,979,577
92MT 3,979,056
92WT 3,979,055
150.2 3,979,579
150.53 3,979,580
151.33 3,979,581
156 3,979,057
3,979,058
193 3,979,582

CLASS 236
46R 3,979,059
3,979,060

CLASS 239
2S 3,979,061
11 3,979,062
70 3,979,063
107 3,979,064
127.3 3,979,065
252 3,979,066
265.35 3,979,067
284R 3,979,068
400 3,979,069
542 3,979,070
653 3,979,071
689 3,979,072

CLASS 240
1.3 3,979,583
78F 3,979,584

CLASS 241
5 3,979,073
30 3,979,074
93 3,979,075
101.2 3,979,076
101.7 3,979,077
191 3,979,078

CLASS 242
75.2 3,979,079
78.6 3,979,080
84.1A 3,979,081
84.2R 3,979,082
107.4R 3,979,083
158F 3,979,084

CLASS 244
3.15 3,979,085
3.19 3,979,086
54 3,979,087
122AB 3,979,088
122AD 3,979,089
175 3,979,090

CLASS 246
8 3,979,091
34R 3,979,092

CLASS 248
56 3,979,093
60 3,979,094
63 3,979,095
75 3,979,096
211 3,979,097
247 3,979,098
418 3,979,099

CLASS 249
48 3,979,100
97 3,979,101

CLASS 250
201 3,979,585
209 3,979,586
211J 3,979,587
239 3,979,588
252 3,979,589
265 3,979,300
305 3,979,590
317 3,979,591
352 3,979,325
363S 3,979,592
364 3,979,593
451 3,979,595
569 3,979,594
575 3,979,596

CLASS 251
11 3,979,102
97 3,979,103
121 3,979,105
214 3,979,104

CLASS 252
1 3,979,301
2 3,979,302
8.5C 3,979,303
3,979,304
3,979,305
8.6 3,979,306
8.75 3,979,307
32.5 3,979,308
3,979,309
62.51 3,979,310
82 3,979,311
99 3,979,312
3,979,313
140 3,979,314
170 3,979,317
180 3,979,315
186 3,979,318
189 3,979,316
299 3,979,319
3,979,320
3,979,321
301.6P 3,979,322
311.5 3,979,323
359E 3,979,326
364 3,979,324
3,979,327
373 3,979,328
422 3,979,329
441 3,979,331
3,979,332
3,979,333
445 3,979,330
448 3,979,334
455R 3,979,336
455Z 3,979,335
466J 3,979,337
522 3,979,338
524 3,979,339
548 3,979,340

CLASS 254
18 3,978,576
134.3FT 3,979,106

CLASS 259
10 3,979,107

CLASS 260
2.5F 3,979,341
2.5N 3,979,342
16 3,979,343
18TN 3,979,344
23CP 3,979,346
23XA 3,979,345
23H 3,979,180
28.5D 3,979,347
29.4UA 3,979,348
29.6RW 3,979,349
30.2 3,979,350
32.8R 3,979,351
33.4R 3,979,352
33.6EP 3,979,353
37EP 3,979,354
3,979,355
42.26 3,979,356
42.46 3,979,357
45.75N 3,979,358
45.75S 3,979,359
45.85B 3,979,360
67.6R 3,979,362
77.5AM 3,979,364
77.5AT 3,979,363
77.5NC 3,979,365
79.5C 3,979,367
3,979,369
112G 3,979,375
152 3,979,376
154 3,979,377
156 3,979,378
239BC 3,979,379
239.7 3,979,380
240A 3,979,381
242 3,979,382
243C 3,979,383
243 3,979,384
245.5B 3,979,399
247 3,979,385
249.7A 3,979,392
250Q 3,979,387
256.4Q 3,979,386
256.5R 3,979,388
3,979,389
268TR 3,979,391
268R 3,979,390
281G 3,979,393
283BZ 3,979,394
288CF 3,979,397
293.53 3,979,395
293.68 3,979,396
294.8F 3,979,398
297R 3,979,400
301 3,979,401
302D 3,979,403
302R 3,979,402
306.8F 3,979,404
307C 3,979,406
307F 3,979,405
308D 3,979,407
309.6 3,979,408
310A 3,979,412
310R 3,979,409
326N 3,979,410
326.1 3,979,413
327M 3,979,411
335 3,979,414
340.5 3,979,415
346.3 3,979,416
348R 3,979,425
397.45 3,979,417
404.5 3,979,426
448.8R 3,979,418
3,979,419
3,979,420
453PC 3,979,427
453P 3,979,421
455A 3,979,428
455R 3,979,422
456P 3,979,423
463 3,979,429
465K 3,979,430
465R 3,979,431
465.2 3,979,432
465.4 3,979,433
468H 3,979,424
3,979,434
471R 3,979,437
473A 3,979,435
3,979,438
3,979,439
3,979,440
482P 3,979,442
482R 3,979,441
485R 3,979,443
486R 3,979,436
490 3,979,444
508 3,979,445
514D 3,979,446
518R 3,979,447
524N 3,979,448
534E 3,979,449
537P 3,979,450
543H 3,979,451
551C 3,979,453
551S 3,979,452
556A 3,979,454
566A 3,979,455
570.7 3,979,456
570.9 3,979,361
584R 3,979,457
586E 3,979,458
591 3,979,459
609F 3,979,460
614A 3,979,461
619B 3,979,462
621R 3,979,464
623D 3,979,463
639R 3,979,465
642C 3,979,466
646 3,979,467
649DP 3,979,468
653 3,979,469
658R 3,979,470
666A 3,979,471
668R 3,979,472
674R 3,979,473
677S 3,979,474
683.42 3,979,475
683.47 3,979,476
835 3,979,477
850 3,979,478
857F 3,979,479
3,979,480
3,979,481
897C 3,979,482
951 3,979,483
3,979,484

CLASS 261
30 3,979,485

CLASS 264
3B 3,979,486
24 3,979,487
40.7 3,979,488
51 3,979,489
81 3,979,490
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	241,348		241,311	18	241,343		241,318		241,365	48	241,298
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1	T950,001		T950,011	17	T950,006	36	T950,002	47	T950,003	51	T950,009
1	T950,004	10	T950,008	26	T950,010	39	T950,007		T950,005		

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